Dave Heineman
Governor

STATE OF NEBRASKA
DEPARTMENT OF NATURAL RESOURCES
Roger K. Patterson
Director

June 10, 2005

IN REPLY TO:

TO: Members of the Negotiated Rulemaking Committee
Members of the Water Policy Task Force

FROM: Roger K. Patterson

SUBJECT: Draft Report and Draft Proposed Rule

STATE'S EXHIBIT 6 6-11-05 kpl

Attached are the second draft of the Negotiated Rulemaking Committee Report, with Exhibits (being sent to members of the Negotiated Rulemaking Committee only), and the Department's proposed rule pursuant to Neb. Rev. Stat. Section 46-713, (being sent to members of the Committee as well as members of the Water Policy Task Force). We have provided black and white copies of certain Exhibits to the Report that were in color. The final Report will include color copies of those Exhibits.

The initial draft of the Report and the rule were previously provided to members of the Negotiated Rulemaking Committee. The Department has made significant revisions to both the draft Report and the proposed rule following receipt of written comments from members of the Committee.

We plan to hold a final meeting of the Committee on Tuesday, June 28, 2005 at 1:00 p.m. at the Quality Inn and Suites in North Platte. Members of the Water Policy Task Force are invited to attend. We want to provide an opportunity for Water Policy Task Force members to be briefed and provide input prior to formal publication of the draft rule. The agenda for the meeting is as follows: 1) Department of Natural Resources presentation on the draft Report and proposed rule, 2) opportunity for comment by members of the Negotiated Rulemaking Committee and the Water Policy Task Force, 3) opportunity for comment by the public. Notice of this meeting will be published in advance of the meeting.

Pursuant to Neb. Rev. Stat. Section 84-929(5), the Negotiated Rulemaking Committee did reach a consensus on that portion of the proposed rule relating to the types of data and other information that will be considered for making the preliminary determination required by Section 46-713 (Part A. of the proposed rule). However, the Committee did not achieve consensus on the balance of the proposed rule relating to criteria to be used for making the determinations and

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geographic area within which surface water and ground water will be considered to be hydrologically connected (Parts B. and C. of the proposed rule).

The Committee is to transmit to the Department a report specifying areas in which the Committee reached consensus, and the issues that remain unresolved. The draft is intended to fulfill the Committee's obligation in that regard.

Following the meeting on June 28th, the Department intends to publish notice of a hearing relating to adoption of the proposed rule (including any revisions made as a result of or following the June 28th meeting).

We hope you will be able to attend the meeting on the 28th, and look forward to your input.

Enclosures:

For Negotiated Rulemaking Committee Members:
Draft Report
Draft Proposed Rule

For Water Policy Task Force Members:
Draft Proposed Rule

**Department of Natural Resources**
**Proposed Rule Pursuant to Neb. Rev. Stat. § 46-713**

001 FULLY APPROPRIATED. Pursuant to Neb. Rev. Stat. § 46-713(3) (Reissue 2004, as amended), a river basin, subbasin, or reach shall be deemed fully appropriated if the Department of Natural Resources determines that then-current uses of hydrologically connected surface water and ground water in the river basin, subbasin, or reach cause or will in the reasonably foreseeable future cause (a) the surface water supply to be insufficient to sustain over the long term the beneficial or useful purposes for which existing natural flow or storage appropriations were granted and the beneficial or useful purposes for which, at the time of approval, any existing instream appropriation was granted, (b) the streamflow to be insufficient to sustain over the long term the beneficial uses from wells constructed in aquifers dependent on recharge from the river or stream involved, or (c) reduction in the flow of a river or stream sufficient to cause noncompliance by Nebraska with an interstate compact or decree, other formal state contract or agreement, or applicable state or federal laws.

001.01 For purposes of Section 46-713(3)(a), the surface water supply for a river basin, subbasin, or reach shall be deemed insufficient, if, after considering the impact of the lag effect from existing groundwater pumping in the hydrologically connected area that will deplete the water supply within the next 25 years, it is projected that there will be insufficient water supply in that basin, subbasin or reach to meet the following interference criteria:

During the period of May 1 through September 30, inclusive, junior irrigation rights are able to divert sufficient surface water to meet on average eighty-five percent of the annual crop irrigation requirement, and during the period of July 1 through August 31, inclusive, must be able to divert sufficient surface water to meet at least sixty-five percent of the annual crop irrigation requirement.

The availability of stream flow will be based on the percentage of time junior rights were able to divert water during the previous 20 year period and the projected impacts of depletions on stream flow from existing wells over the next 25 years.

In the event that the junior water rights are not irrigation rights, the Department will utilize a standard of interference appropriate for the use, taking into account the purpose for which the appropriation was granted.

001.02 The geographic area within which the Department preliminarily considers surface water and ground water to be hydrologically connected for the purpose prescribed in Section 46-713(3) is the area within which pumping of a well for 50 years will deplete the river or a base flow tributary thereof by at least 10% of the amount pumped in that time.

002 INFORMATION CONSIDERED. For making preliminary determinations required by Neb. Rev. Stat. Section 46-713 (Reissue 2004, as amended) the Department will use the best scientific data and information readily available to the Department at the time of the determination. Information to be considered will include:

Surface water administrative records
Department Hydrographic Reports
Department and United States Geological Survey stream gage records
Department's registered well data base
Water level records and maps from Natural Resources Districts, the Department, the University of Nebraska, the United States Geological Survey or other publications subject to peer review
Technical hydrogeological reports from the University of Nebraska, the United States Geological Survey or other publications subject to peer review
Ground water models
Current rules and regulations of the Natural Resources Districts

The Department shall review this list periodically, and will propose amendments to this rule as necessary to incorporate scientific data and information that qualifies for inclusion in this rule, but was not available at the time this rule was adopted.

# DRAFT

Report of Negotiated Rulemaking Committee

Pursuant to Neb. Rev. Stat. § 46-713 (Reissue 2004), by January 1 of each year beginning in 2006, the Department of Natural Resources (Department) shall complete an evaluation of the expected long-term availability of hydrologically connected water supplies for both existing and new surface water uses and existing and new ground water uses in each of the state's river basins and shall issue a report that describes the results of the evaluation. Section (d) of this statute states that in preparing the report, the Department shall rely on the best scientific data and information readily available …and shall specify by rule and regulation the types of scientific data and other information that will be considered for making the preliminary determinations required by this section. The members of the Committee listed in Exhibit 1 consisted of all those who expressed an interest in serving on the Committee in response to a Notice of Intent to Establish Negotiated Rulemaking Committee published October 26, 2004. This Report is prepared pursuant to Neb. Rev. Stat. § 84-929(5) (Reissue 1999) by the Negotiated Rulemaking Committee (Committee), which was established on December 8, 2004 by the Department.

The primary purpose of the Committee was to develop a report and/or proposed rule relating to the types of scientific data and other information that will be considered for making the preliminary determinations required to prepare a report pursuant to Neb. Rev. Stat. § 46-713(d) (Reissue 2004). Although not required by statute, the Committee also worked to develop the criteria that will be used for making the required preliminary determinations of: (1) whether a river basin, subbasin, or reach is fully appropriated without the initiation of additional uses, and (2) the geographic area within which the Department considers surface water and ground water to be hydrologically connected for the purposes of any such determination, pursuant to the evaluations and reports that the Department must complete by January 1, of each year beginning in 2006, required by section 46-713 N.R.S. 1943, as amended.

The Committee met a total of seven times. Following its initial meeting in December, subsequent meetings of the Committee reviewed information relating to levels of interference and degrees of hydrologic connectivity and considered whether such information could be utilized to arrive at the formulation of a rule. Dr. Raymond J. Supalla, an agricultural economist and professor and assistant dean in the College of Technical Agriculture, provided the Committee a method for doing an economic analysis of the amount of water that would be needed for the irrigation of crops in order to make investment in irrigation economically beneficial. Jeff Shafer and James Cannia, both from the Department provided a method and examples of an analysis that could be used to determine the amount of flow expected to be available without further development in a river basin. Shafer and Cannia also provided maps for comparison purposes showing various degrees of connectivity of ground water to streams in certain river basins in the state.

The Committee considered at length various draft rules proposed by groups of Committee members and the Department. Committee meetings included considerable discussion of the various proposals regarding (A) the types of scientific data and other information that will be

considered for making the preliminary determinations pursuant to Neb. Rev. Stat. § 46-713(d) (Reissue 2004) and the criteria that will be used for making preliminary determinations of: (B) whether a river basin, subbasin, or reach is fully appropriated without the initiation of additional uses, and (C) the geographic area within which the Department considers surface water and ground water to be hydrologically connected for the purposes of any such determination.

The initial draft of this Report was circulated to the Committee prior to finalization. Committee members were provided an opportunity to include as an addendum to the Report additional information, recommendations, or materials.

The Department received comments from 13 of the 17 members of the Committee. The Department reviewed the comments, and made revisions to the Report and the proposed Rule based on the comments received. The Exhibits to this Report include copies of the written comments received from members of the Committee.

## A. Types of scientific data and other information to be considered for making preliminary determinations

The initial draft of this Report indicated that the Committee was able to reach consensus on the need for the Department to consider the following types of scientific data and other information for making the preliminary determinations:

1) Surface water administrative records

2) Department hydrographic reports

3) Department and USGS stream gage records

4) Department registered well database

5) Water level records and maps from Natural Resources Districts, the Department, the University of Nebraska, the United States Geologic Survey (USGS) or other publications subject to peer review

6) Technical hydrogeological reports from the University of Nebraska, the USGS, or other publications subject to peer review

7) Ground water models

8) Current rules and regulations of the Natural Resources Districts

9) Best scientific information and tools available to the Department to identify impacts of "hydrologically connected" uses to the basin, subbasin, or reach being considered

Following circulation of the initial draft of this Report to the members of the Committee, the Department received written comments from all but three of the other members of the Committee. None of the written comments disagreed that consensus had been reached on this item.

**B. <u>Criteria to be used for making preliminary determinations of whether a river basin, subbasin, or reach is fully appropriated</u>**

Regarding the criteria that will be used for making preliminary determinations of whether a river basin, subbasin, or reach is fully appropriated without the initiation of additional uses, the Department's initial draft of this Report indicated that the Committee generally agreed to a three-step process. The process was described as follows: First, the analysis should determine the percentage of time that the most junior surface water appropriators located within a basin, subbasin, or reach were able to divert. Second, deduct from the available flows the depletions to stream flow from the future lag effect of existing ground water wells and adjust the determination of the ability to divert accordingly. Third, assuming that when junior appropriators are allowed to divert they could divert at their permitted diversion rate, the analysis should determine what percentage of the crop irrigation requirement could be met by these diversions. This analysis assumes that in most cases the junior appropriations will be for irrigation. If the junior appropriation was for another use, a separate analysis of the water needs of the use would be made.

Members of the Committee who commented on the initial draft either (1) did not disagree that a consensus had been reached on this item (one respondent); (2) agreed that there had been consensus that a three step process should be used, but disagreed as to the second step (one respondent), the third step (one respondent), the second and third step (one respondent), or all three steps (one respondent) of the process; or (3) disagreed that consensus had been reached as to this item (eight respondents).

After discussing in Committee meetings various potential criteria for determining whether a basin was fully appropriated, the Department proposed the following criteria:

> A basin, subbasin or reach is not fully appropriated if during the period of May 1 through September 30, inclusive, the most junior irrigation right is able to divert on average ninety percent of the crop irrigation requirement of surface water per acre, and during the period of July 1 through August 15, inclusive, is able to divert at least eighty-five percent of the above amount. The lagged impact of existing ground water pumping will be considered for twenty-five years.



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There was considerable discussion of instream flow rights by the Committee, and whether and how they should be considered in the determination process. No consensus was reached on this issue.

Various groups within the Committee proposed the use of different percentages of the crop irrigation requirement. One group suggested that the flow available for the most junior surface water appropriations must be at least 99% of their appropriated right at the same frequency of occurrence of flows available as when the appropriation was granted. A third group refrained from specifying a percentage, but preferred a formulation of the rule as follows:

> Within the next ___ year period, the flow of the stream/river is calculated to be insufficient in an average precipitation year, to provide the amount of water needed to achieve the purpose for which the most junior appropriation located within that basin, subbasin, or reach, was granted.

This group noted that in determining what amount of water is "needed," the Department can use any number of techniques, but must explain in reasonable detail the technique used when it issues its annual determinations. This group noted that an example of such a technique would be the crop irrigation requirement approach.

There was no agreement on the time that should be used when calculating the lagged impact of ground water pumping on stream flow. Different groups within the Committee proposed that the lag effect from existing ground water pumping should be calculated for various numbers of years, including 10 years and 50 years; the Department suggested 25 years.

In addition, the Committee did not reach a consensus that these were the only factors to consider. Other factors were suggested; however the methods that should be used to include these factors were not presented. The suggested additional factors included:

1) Impacts of existing groundwater uses on the transport of storage water or other protected water through the basin, subbasin, or reach

2) Impacts of groundwater pumping on the aquifers dependent on flows in streams for recharge

3) Hydrological effects of long-term trends in precipitation and meteorological conditions

4) The effects of the development trends over the last five years for new surface water and groundwater uses projected over the next five years as it impacts the long-term availability of hydrologically connected water supplies



6-8.

Following circulation of the initial draft of this Report to the members of the Committee, and receipt and consideration of comments, the Department determined to revise its proposed criteria as follows:

A basin, subbasin or reach is not fully appropriated if during the period of May 1, through September 30, inclusive, junior irrigation rights are able to divert sufficient surface water to meet on average eighty-five percent of the annual crop irrigation requirement, and during the period of July 1 through August 31, inclusive, must be able to divert sufficient surface water to meet at least sixty-five percent of the annual crop irrigation requirement. The lagged impact of existing ground water pumping will be considered for twenty-five years.

C. **The geographic area within which the Department considers surface water and ground water to be hydrologically connected**

The Department's initial draft of this Report indicated that the Committee agreed that the geographic area within which the Department considers surface water and ground water to be hydrologically connected for the purposes of any such determination should be based on an assessment of the amount of time that it would take for depletions from a well a certain distance from the stream to cause a depletion to the stream equal to a certain percentage of the amount of water pumped by the well over the same period. Any well within the boundary produced by this assessment would be considered hydrologically connected to the stream.

Members of the Committee who commented on the initial draft of this Report either (1) did not disagree that a consensus had been reached on this item (one respondent); (2) agreed consensus had been reached that the determination should be made based on the assessment discussed in the previous paragraph, but did not agree on the percentage or time that should be used to make that determination (two respondents); (3) disagreed that consensus had been reached on this item (three respondents); or (4) expressed a preference for a different percentage and time than the Department proposed (four respondents).

The Department proposed that this boundary be determined using the best ground water models available for the area or, where no valid ground water model existed, the determination would be based on the best sound science approach currently available. [1]

During the course of the Committee's meetings, the Department was requested to, and did, provide sample maps for certain basins using the Jenkins method,

[1]The Jenkins method is used for similar water administration purposes in other states. Jenkins, C. T. Techniques of Water Resources Investigations of the United States Geological Survey, Chapter D1, Computation of Rate and Volume of Stream Depletion by Wells, Book 4, Hydrologic Analysis and Interpretation, 1970.

depicting the possible geographic location of stream depletion lines using the following criteria:

| | |
|---|---|
| 5%/50 years | .01%/100 years |
| 10%/50 years | 5%/100 years |
| 15%/50years | 15%/75 years |
| 25%/50 years | 50%/10 years |
| 2.5%/50 years | 1%/50 years |
| 28%/40 years | |

Note that not all stream depletions lines were calculated for all basins. It was emphasized that the sample maps provided were not intended to be exact depictions of where the actual stream depletion lines might be located using the Jenkins method following adoption of any rule.

The Department suggested that the geographic area within which surface water and ground water would be considered hydrologically connected should be the area within which pumping a well for 50 years will deplete the river or a base flow tributary thereof by at least 10% of the amount pumped in that time.

Included as Exhibits 30, 31, and 32 to this Report are the three proposals discussed by the Committee.

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EXHIBITS

1. List of Committee Members
2. Committee Charge
3. Committee Timeline
4. Selected Nebraska Statutes relating to Negotiated Rulemaking
5. Memo dated January 7, 2005 from Ann Bleed to Negotiated Rulemaking Committee RE: Technical Data
6. Document by J. Michael Jess
7. Maps (3) of Stream Depletion Lines for the Middle Niobrara River in Cherry County
8. Maps (3) of Stream Depletion Lines for the Republican River
9. Memo dated January 13, 2005 from Ann Bleed to Negotiated Rulemaking Committee RE: Technical Data and Draft Rule for your consideration
10. Maps (3) of Stream Depletion Lines for the Platte River
11. Maps (3) of Stream Depletion Lines for the Platte River, Republican River, and Middle Niobrara River
12. Committee Timeline (revised)
13. Map of Stream Depletion Line Comparison (28%/40 years and COHYST Drawn 28%/40 years)
14. Map of Stream Depletion Line Comparison (28%/40 years and 10%/50 years)
15. Map of Stream Depletion Line Comparison (2.5%/50 years and 10%/50 years)
16. Map of Stream Depletion Line Comparison (10%/50 years on each: Platte, Niobrara, Loup, Upper Elkhorn, Republican and 28%/40 years on Platte)
17. Map of Stream Depletion Line Comparison (10%/50 years on each: Platte, Niobrara, Loup, Upper Elkhorn, Republican and 28%/40 years on each)
18. Map of Stream Depletion Line Comparison (10%/50 years on each: Platte, Niobrara, Loup, Upper Elkhorn, and Republican)
19. Map of Stream Depletion Lines for Platte River Basin (25%/50 years; 15%/50 years; 5%/50 years)
20. Map of Stream Depletion Lines for Loup, Niobrara, Platte, and Republican River Basins (25%/50 years; 15%/50 years; 5%/50 years)
21. Map of Stream Depletion Lines for Loup River Basin (25%/50 years; 15%/50 years; 5%/50 years; 1%/50 years)
22. Document: Considerations for Determining "Fully Appropriated" Areas (provided by Don Blankenau)
23. Document: Basic Assumptions Used in the Development of the Department of Natural Resources Proposed Method to Determine Whether a Stream and the Hydrologically Connected Ground Water Aquifers Are Fully Appropriated
24. Document: For Negotiated Rules Committee Meeting February 1, 2005/Proposed Method to Determine the Lag Effect of a Pumping Well on a Stream Where Acceptable Ground Water Models Do Not Exist
25. Document: Flow Administration Analysis – Loup and Big Blue River Basins
26. Document: Ray Supalla's spread sheet for negotiated rules committee
27. email and draft from Dan Smith to Roger Patterson, dated February 7, 2005



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28. email and draft from Brian Barels to Roger Patterson and Ann Diers dated March 4, 2005
29. Handout re citations to use of term "de minimis" (supplied by Steve Huggenberger)
30. Department Proposed Draft Rule for 3/18/05 Meeting
31. Donald G. Blankenau Memorandum Proposal for 3/18/05 Meeting
32. Don Kraus Negotiated Rulemaking Proposal for 3/18/05 Meeting
33. Article: History of Drought in Nebraska
34. Copy of letter dated April 29, 2005, from Dennis Strauch
35. Copy of letter dated May 2, 2005, from Don Kraus
36. Copy of letter dated May 2, 2005, from Allan J. Schmidt
37. Copy of letter dated May 2, 2005, and attachments, from John Turnbull
38. Copy of email dated May 2, 2005, from Duane Hovorka
39. Copy of letter dated May 3, 2005, and attachment, from Donald G. Blankenau
40. Copy of letter dated May 3, 2005, and attachment, from Rex Amack
41. Copy of letter dated May 3, 2005, from Larry Hutchinson
42. Copy of email dated May 3, 2005, from Steven Huggenberger
43. Copy of email dated May 3, 2005, and attachment, from Brian Barels
44. Copy of email dated May 3, 2005, and attachment, from Dennis Schueth
45. Copy of letter dated May 3, 2005, from Ron Bishop
46. Copy of memo dated May 3, 2005, from Dan Smith
47. Copy of email dated May 3, 2005, and attachment, from Jay E. Rempe
48. Copy of email dated May 3, 2005, and attachment, from Chad Smith

EXHIBIT 1

Nebraska Department of Natural Resources

Negotiated Rulemaking Committee

Member List

| Member | Entity Represented |
|---|---|
| Mike Allen | Nebraska Well Drillers |
| Brian Barels | Public Power and Irrigation Districts and Nebraska Public Power Districts |
| Don Blankenau | League of Municipalities |
| Ron Bishop | Nebraska Groundwater Management Coalition |
| Steve Huggenberger | City of Lincoln |
| J. Larry Hutchinson | Instream Flow Appropriations, threatened and endangered species, surface and groundwater uses by Agency Facilities, other water based fish, wildlife, recreation uses. Game and Parks Commission |
| Don Kraus | Central Nebraska Public Power and Irrigation District |
| Roger Patterson | Nebraska Department of Natural Resources |
| Scott D. Peterson | Small Municipalities, City of Ashland |
| Jay Rempe | Nebraska Farm Bureau Federation |
| Al Schmidt | Nebraska State Irrigation Association |
| Dennis Schueth | Ground Water Management Coalition, Upper Elkhorn Natural Resources District |
| Chad Smith | American Rivers and the Nebraska Wildlife Federation |
| Dan Smith | Middle Republican Natural Resources District<br>Nebraska Association of Resources Districts<br>Nebraska Republican River Management Districts Association |
| Dennis Strauch | Surface water users, Irrigation Districts<br>Pathfinder Irrigation District |
| John Turnbull | Nebraska Association of Resources Districts |
| Lyndon Vogt | Ground Water Management Coalition, Upper Niobrara White Natural Resources District |
| **Legal Counsel** | |
| Ann Diers | Nebraska Department of Natural Resources |

EXHIBIT 2

**Nebraska Department of Natural Resources**
**Negotiated Rulemaking Committee**
**Committee Charge**
**December 8, 2004**

This Negotiated Rulemaking Committee ("Committee") has been formed to prepare a report and/or proposed rule(s) relating to the evaluations and reports that the Department must complete, pursuant to Neb. Rev. Stat. Section 46-713 (Cum. Supp. 2004) by January 1 of each year beginning in 2006. The law requires that the Department specify by rule and regulation "the types of scientific data and other information that will be considered for making the preliminary determinations" of fully appropriated. Therefore, the law would limit what this Committee would be expected to produce.

The report and/or rule(s) produced by the Committee will relate specifically to the types of scientific data and other information that will be considered and the criteria that will be used by the Department for making the preliminary determinations of: (1) whether a river basin, subbasin, or reach is fully appropriated without the initiation of additional uses, and (2) the geographic area within which the Department considers surface water and ground water to be hydrologically connected for the purposes of any such determination.

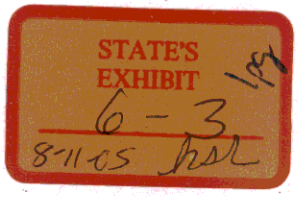
The Department believes it would be useful if the Committee's work would encompass the criteria the Department should consider in making the preliminary determinations, specifically the level of interference with existing appropriators that should be allowable and the degree of hydrologic connectivity between ground water and surface water. The Department is broadening the Committee's charge to include these additional items.

Exhibit 3

**Nebraska Department of Natural Resources**
**Negotiated Rulemaking Committee**
**Committee Timeline**
**December 8, 2004**

The timeline for the Negotiated Rulemaking Committee is extremely tight (the initial notice indicated that any report or draft rule from the Committee must be produced by March 1, 2005). For that reason, the Department took the initial step of drafting a timeline to assist the Committee. The following is the schedule of meetings and possible tasks for the Negotiated Rulemaking Committee, with the goal of obtaining a final product by the end of the first week in March.

| **Meeting Date** | **Tasks/Location** |
|---|---|
| January 21, 2005 | Consider draft documents produced by the Department on the level of interference to be allowable, and hydrologic connectivity. Consider levels of interference and hydrologic connectivity utilized in other states. Work towards a baseline of understanding/thinking on the subject. Kearney |
| February 1, 2005 | Work on reaching agreement on both interference and hydrologic connectivity. Discuss options. Get draft of rules circulated to Committee members following meeting. Lincoln |
| February 17, 2005 | Work on refining rule. Kearney |
| March 3, 2005 | Meet to finalize rule. Kearney |



**84-927. Negotiated rulemaking committee; establishment; notice of decision; agency support; termination.** (1) If, after considering comments and applications for membership on the negotiated rulemaking committee submitted pursuant to section 84-926, the agency determines that a negotiated rulemaking committee can adequately represent the interests of the persons that will be significantly affected by a proposed rule and that it is feasible and appropriate in the particular rulemaking, the agency may establish a negotiated rulemaking committee.

(2) If, after considering comments and applications submitted pursuant to section 84-926, the agency decides not to establish a negotiated rulemaking committee, the agency shall notify the persons who commented on or applied for membership on the negotiated rulemaking committee of the reasons for the decision. The agency shall also publish a notice of the decision not to establish a negotiated rulemaking



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committee in a newspaper having general circulation in the state and, as appropriate, in other newspapers and publications.

(3) The agency shall provide appropriate administrative support to the negotiated rulemaking committee, including technical assistance and support.

(4) A negotiated rulemaking committee shall terminate upon the adoption of the final rule under consideration by the agency pursuant to the Administrative Procedure Act unless the agency, after consulting the committee, or the committee itself specifies an earlier termination date.

**Source:** Laws 1994, LB 446, § 7.

Cross Reference

**Administrative Procedure Act,** see section 84-920.

**84-928. Negotiated rulemaking committee; membership; procedure.** (1) A negotiated rulemaking committee may by consensus expand its membership, either by contacting and recruiting persons whose participation the committee believes is essential to the success of the negotiated rulemaking process or upon reviewing a petition submitted pursuant to subsection (2) of this section.

(2) Persons who will be significantly affected by a proposed rule and who believe that their interests will not be adequately represented by any person on a negotiated rulemaking committee may petition for or nominate another person for membership on the negotiated rulemaking committee. Each petition or nomination shall be submitted to the negotiated rulemaking committee and shall include:

(a) The name of the petitioner or nominee and a description of the interests the person represents;

(b) Evidence that the petitioner or nominee is authorized to represent parties related to the interests the person proposes to represent;

(c) A written commitment that the petitioner or nominee will actively participate in good faith in the development of the rule under consideration; and

(d) An explanation of reasons that the persons already on the negotiated rulemaking committee do not adequately represent the interests of the person submitting the petition or nomination.

(3) Upon receiving a petition, a negotiated rulemaking committee shall decide by consensus at its next meeting whether or not to expand its membership.

**Source:** Laws 1994, LB 446, § 8.

**84-929. Negotiated rulemaking committee; powers and duties; consensus; procedure; report; contents.** (1) A negotiated rulemaking committee shall consider the matter proposed by the agency for consid-

eration and shall attempt to reach consensus concerning a proposed rule and any other matter the committee determines is relevant to the proposed rule.

(2) The person representing the agency on a negotiated rulemaking committee shall participate in the deliberations of the committee with the same rights and responsibilities of other members of the committee and shall be authorized to fully represent the agency in the discussions and negotiations of the committee.

(3) A negotiated rulemaking committee may adopt procedures or ground rules for the operation of the committee.

(4) If a negotiated rulemaking committee achieves consensus on a proposed rule at the conclusion of the negotiations, the committee shall transmit to the agency that established the committee a report containing the proposed rule.

(5) If a negotiated rulemaking committee does not reach a consensus on the proposed rule, the committee shall transmit to the agency a report specifying areas in which the committee reached consensus and the issues that remain unresolved. The committee may include in the report any other information, recommendations, or materials that the committee considers appropriate. Any member of the committee may include as an addendum to the report additional information, recommendations, or materials.

Source: Laws 1994, LB 446, § 9.

**84-930. Facilitator; selection; duties.** (1) An agency may nominate a person to serve as a facilitator for the negotiations of the negotiated rulemaking committee, subject to the approval of the committee by consensus. If the committee does not approve the agency's nomination for facilitator, the agency shall submit a substitute nomination. If the committee does not approve the substitute nomination of the agency for facilitator, the committee shall select by consensus a person to serve as facilitator. A person designated to represent the agency in substantive issues may not serve as facilitator or presiding officer for the committee.

~~(2) A facilitator approved or selected by a negotiated rulemaking~~ committee shall:

(a) Preside at the meetings of the committee in an impartial manner;

(b) Impartially assist the members of the committee in conducting discussions and negotiations and achieving consensus; and

(c) Manage the keeping of minutes and records.

Source: Laws 1994, LB 446, § 10.



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**84-931. Convenor or facilitator; contract authorized; state employee; disqualification; members of negotiated rulemaking committee; expenses; per diem; grants or gifts.** (1) An agency may employ or enter into a contract for the services of an organization or individual to serve as a convenor or facilitator for a negotiated rulemaking committee or may use the services of a state employee to act as a convenor or facilitator for a committee.

(2) An agency shall determine whether a person under consideration as a convenor or facilitator of a negotiated rulemaking committee has any financial or other interest that would preclude the person from serving in an impartial and independent manner. A person disqualified under this criterion shall be dropped from further consideration.

(3) Members of a negotiated rulemaking committee shall be responsible for their own expenses of participation. However, an agency may pay for a committee member's actual and necessary expenses incurred in serving on the committee as provided in sections 81-1174 to 81-1177 and a reasonable per diem rate of compensation if:

(a) The committee member certifies a lack of adequate financial resources to participate in the committee; and

(b) The agency determines that the committee member's participation in the committee is necessary to ensure an adequate representation of the interests of the members.

(4) An agency may accept grants or gifts from any source to fund the negotiated rulemaking process if:

(a) Information on the name of the person giving the grant or gift and the amount of the grant or gift is available to the public;

(b) The grant or gift is given to and accepted by the agency without placing any condition on the membership of a negotiated rulemaking committee or the outcome of the negotiated rulemaking process; and

(c) There is consensus among the members of the negotiated rulemaking committee that the acceptance of the grant or gift will not diminish the integrity of the negotiated rulemaking process.

**Source:** Laws 1994, LB 446, § 11.

**84-932. Agency action; judicial review; limitation; negotiated rule; judicial review; treatment.** Any agency action relating to establishing, assisting, or terminating a negotiated rulemaking committee under the Negotiated Rulemaking Act shall not be subject to judicial review. Nothing in this section shall bar judicial review if such judicial review is otherwise provided by law. A rule which is the product of negotiated rulemaking prior to formal adoption pursuant to the Administrative Procedure Act and is later subject to judicial review shall not be

accorded greater deference by a court than a rule which is the product of the rulemaking procedure of the Administrative Procedure Act alone.

Source: Laws 1994, LB 446, § 12.

Cross Reference

Administrative Procedure Act, see section 84-920.

S

Exhibit 5

# STATE OF NEBRASKA


**DEPARTMENT OF NATURAL RESOURCES**
**Roger K. Patterson**
*Director*

**Mike Johanns**
*Governor*


January 7, 2005

IN REPLY REFER TO:

TO: Negotiated Rulemaking Committee

FROM: Ann Bleed

SUBJECT: Technical Data

This is the first of two packets of technical information you will be getting to start your discussions on rules for defining a fully appropriated stream reach and the area that is hydrologically connected to the reach.

The first document was written by J. Michael Jess as part of a paper by David Aiken and others surveying how other states have defined overappropriated or fully appropriated streams. In essence only two states, Texas and Oregon, have attempted to develop such a definition. The enclosed document describes what was done.

Second, in order to start your discussion of a rule defining the extent of hydrological connection to a fully appropriated stream, we thought it would be helpful to provide the enclosed area maps. These maps depict Stream Depletion Lines (SDLs) for the two areas in Nebraska, the Niobrara River in Cherry County, and the Republican River. Two additional maps will be forwarded to you when available, one showing the SDLs for the Platte River and one showing the SDLs for all three areas on a single map. SDL lines depict the amount of depletion a well along the line would cause on stream flow as a percentage of the total volume of water consumed by the well within a given time period. Wells between a given line and the stream would cause a greater percentage of depletion within the same time period.

SDLs were created for:

- 50% Depletion in 10 years
- 28% Depletion in 40 years
- 15% Depletion in 75 years
- 5% Depletion in 100 years
- 0.1% Depletion in 100 years

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6-21

The SDL's were created using the Jenkins method[1]. This method is a standard method used by many states to determine the amount of depletion a well would cause on a stream. The result is not as precise as would be achieved with a computer model like MODFLOW, but the results are roughly comparable to those from such models. Inputs into the equation include Transmissivity, Specific Yield, Distance (from point of interest to the stream), and time.

For the Platte River Model, which you will receive when available, the specific yield data were calculated using USGS RASA data. COHYST data was combined with USGS Rasa data for the transmissivity. This was done because the COHYST data does not have the areal extent necessary for some of the SDL's that were created.

For the Niobrara River Model, the transmissivity and specific yield data were calculated using USGS RASA data.

For the Republican River Model, the transmissivity and specific yield data were calculated from the Republican River Compact Administration groundwater model.

[1] Jenkins, C.T. *Techniques for Computing Rate and Volume of Stream Depletion by Wells*, Ground Water Volume 6, Number 2. 1968.

6-22

# Over-Appropriation of Water in Texas and Oregon
## Supplemental Summary

by
**J. Michael Jess, P.E.**
**Conservation & Survey Division, School of Natural Resources**
**University of Nebraska-Lincoln**
**November 11, 2004**

**Texas**

Kellye Rila (pronounced ray-la), Texas Natural Resources Conservation Commission
July 26 and November 2 & 3, 2004

Sec. 11.134(b)(2) of the Texas Code instructs the TNRCC to grant post-1967 applications if there is unappropriated water in the proposed source of supply. In commenting on procedures used in making such assessments, the Texas Supreme Court said in *Lower Colorado River Authority v Texas Department of Water Resources*, 689 S.W.2d 873 (1984) the agency (now the TNRCC) must assume all other water appropriations, including inactive but "un-cancelled appropriations," will divert all amounts officially authorized.

Partly in response to that ruling and in conformance with certain requirements stemming from enactment of other legislation, the TNRCC subsequently promulgated agency Rule, Sec. 297.42. Portions of the rule pertain to diversions of natural flow for irrigation and other uses, for on-channel storage and for off-channel storage. For irrigation diversions, Paragraph (c) is relevant to over-appropriation of natural flow. It states:

> For approval of an application for a direct diversion from a stream without sufficient on or off channel water storage facilities for irrigation, approximately 75% of the water requested must be available approximately 75% of the time when distributed on a monthly basis and based upon the available historic stream flow record. Lower availability percentages may be acceptable if the applicant can demonstrate that the long-term, reliable, alternative source or sources of water of sufficient quantity and quality are economically available to the applicant to make the proposed project viable and ensure the beneficial use of state water without waste.

According to Rila, the TNRRC is not in possession of "written documentation" which might recount the historical rationale underlying adoption of Sec. 297.42(c). Instead, her November 3, 2004 electronic memorandum claimed the " . . . rule is a criteria for what is the minimum reliability an irrigation use needs in order to be beneficially used and avoid waste." The numerical standard emerged from input received during agency rule-making activities. In referring to paragraph (c), Rila's memorandum said, "It represented a criteria that was applied to irrigation water rights and was based loosely on what the banks were willing to accept as reliable (enough) before they would provide funding to farmers."

Notwithstanding the hazy background supporting adoption of Sec. 297.42(c), Rila's remarks suggest its effect has had general support. The agency has employed the rule in creating a series of maps depicting all or portions of 23 watersheds (Lann Bookout, summary of discussion during September 17, 2002 Water Rights Advisory Work Group meeting). The maps are electronically linked to the agency WEB page.

Each map effectively provides members of the public an initial screening device for judging whether applications submitted to the TNRRC are likely to be approved. So-called "Full Appropriation" maps are to be used in evaluating applications for perpetual rights and amendments. "Current Condition" maps are said to include return flow values and are to be used in evaluating applications for term water rights and amendments.

**Oregon**
Richard M. Cooper, Oregon Water Resources Department
July 8 and October 26, 2004

Martha Pagel, Schwabe, Williamson & Wyatt, P.C. (former Director, OWRD)
October 28 and November 2, 2004

Cindy Smith, Oregon Water Resources Department
November 3 and 4, 2004

Adoption of OAR 690-400-0010(11)(a)(A), the so-called 80% rule, began with input gained during a series community workshops organized by the WRD staff. To encourage input, the workshops were informal. They attracted a variety of individuals and organizations.

Ultimately, five staff recommendations were developed from input gathered during the workshops. When formally adopted later by the Water Resources Commission, the recommendations became official policies. Four of the proposed policies were adopted in November 1989. Adoption of the fifth staff recommendation, containing the 80% rule and six other definitions, was delayed until December 1990.

The persons identified above could not initially say why 80% was chosen as a numerical threshold. When asked whether written details from the various workshop proceedings were retained, Pagel and Cooper deferred to Smith. Unfortunately, if such materials still exist, Smith was unable to identify them or find their location.

In further discussing a means of securing answers, Smith provided copies of official records maintained in the WRD's files. Materials provided by her include summaries of verbal remarks and the written comments submitted during or following formal hearings called to gather input prior to adopting the staff-member recommendations.

In a November 21, 1990 memorandum, the Director of the WRD (Pagel's predecessor) told members of the Commission that nearly 300 people submitted written testimony or offered verbal remarks during and following two public hearings. Another memorandum written nine days later indicated receipt of additional remarks from a federal forest management official. Notwithstanding a missed deadline, it was said those remarks were also taken into account.

Judging by the written summary attached to the Director's memoranda, most of the comments received during and following the hearings were in response to proposals pertaining to best management practices, water conservation, "reasonable" waste water efficiencies and "riparian areas." In contrast, very few people reportedly offered comments regarding what ultimately became the 80% rule.

Overall, the records indicate reactions to the proposed 80% rule were mixed, and except for two persons who urged its rejection, the input did not contain comments specific to the numerical threshold. Without substantive modification to the staff-member recommendation, the 80% rule was ultimately adopted by the Commission.

When asked if the numerical value was somehow "based upon scientific evaluation" or if it was selected as a "technical or political compromise," Pagel was not directly responsive. That seems understandable. She lacks first hand knowledge; the rule was adopted prior to her tenure as the WRD Director.

---

Pagel was heard to recall being frequently asked to explain and defend the rule, apparently on numerous occasions. In doing that, she mentioned discussing earlier agency review procedures used in evaluating applications for new water appropriations. She said the previous procedures were characterized as insufficiently rigorous. It was said the 80% rule corrected that shortcoming and resulted in two desirable outcomes.

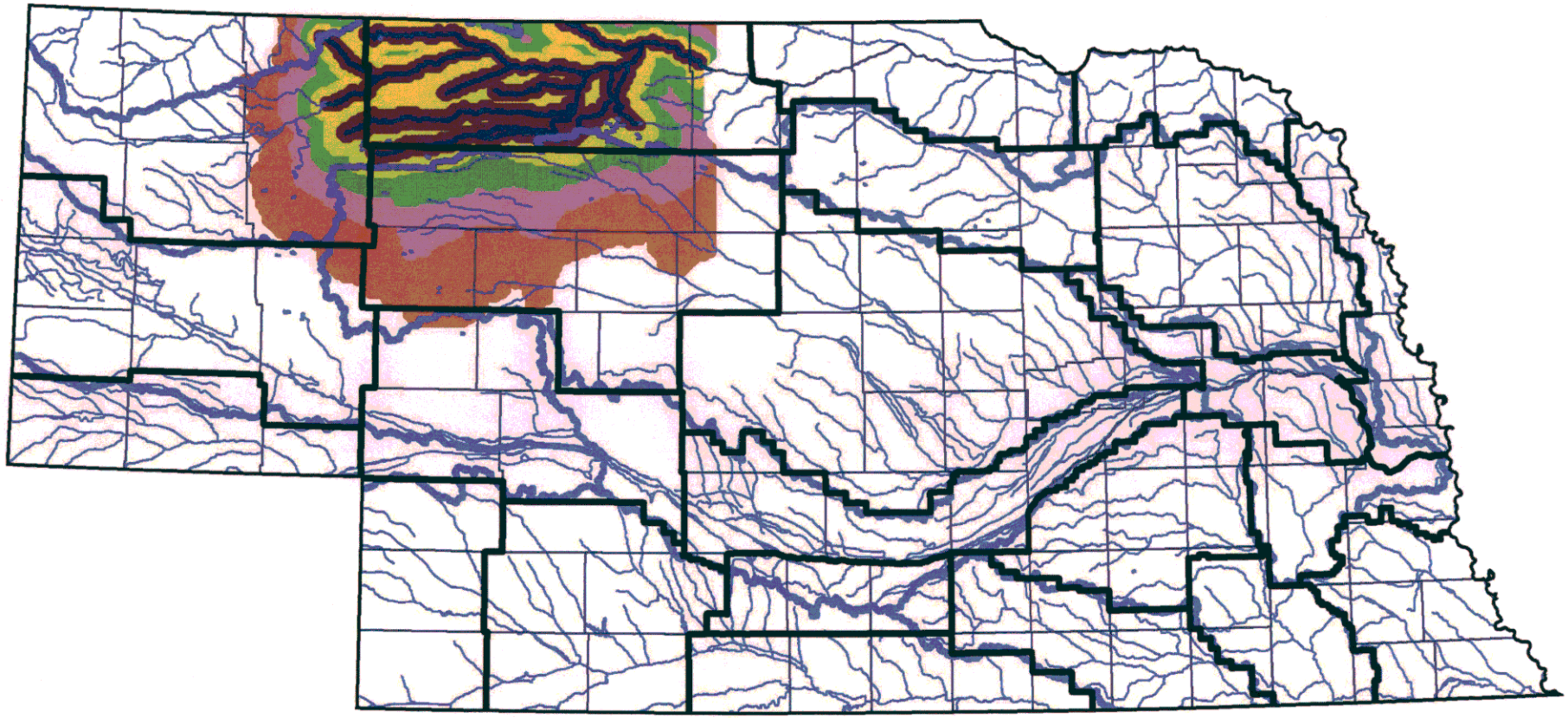
First, it made agency decisions more credible. Prior to adoption of the rule, it was said comprehensive hydrological analyses of stream flows potentially available at proposed points of diversions were not routinely undertaken by WRD staffers. Without realizing existence of that deficiency, members of the public placed undeserved reliance upon agency review of applications for new water appropriations. With their misplaced confidence in the WRD's approval procedures, it was said many people had made unwise investments in headgates, pumping plants and other structures. As a possible consequence, some during that earlier time period even questioned whether resultant liabilities might fall on the WRD.

Second, as a Cabinet official, Pagel said she was frequently confronted with administrative cost containment challenges. By reducing the number of new water appropriations for which sufficient water would not actually be available, and which agency Water Masters would need to expend resources in otherwise avoidable monitoring and regulation activities, both Pagel and Cooper claimed the 80% rule has been effective in slowing an increase in administrative expenses.

In summary, it seems reasonable to conclude that the 80% threshold value emerged during the WRD staff-organized workshop discussions. Judging by the extent of public participation reported in the WRD Director's memoranda, the workshops were successful in soliciting input from large numbers of people and organizations. Had the proposed value not been afforded considerable support by those who participated in the workshops, it is difficult to imagine it progressing toward eventual adoption by members of the Water Resources Commission. Finally, and for whatever it is worth, Cooper claimed current agency staff members consider the 80% rule to be reasonable.

# Stream Depletion Lines

## Middle Niobrara River



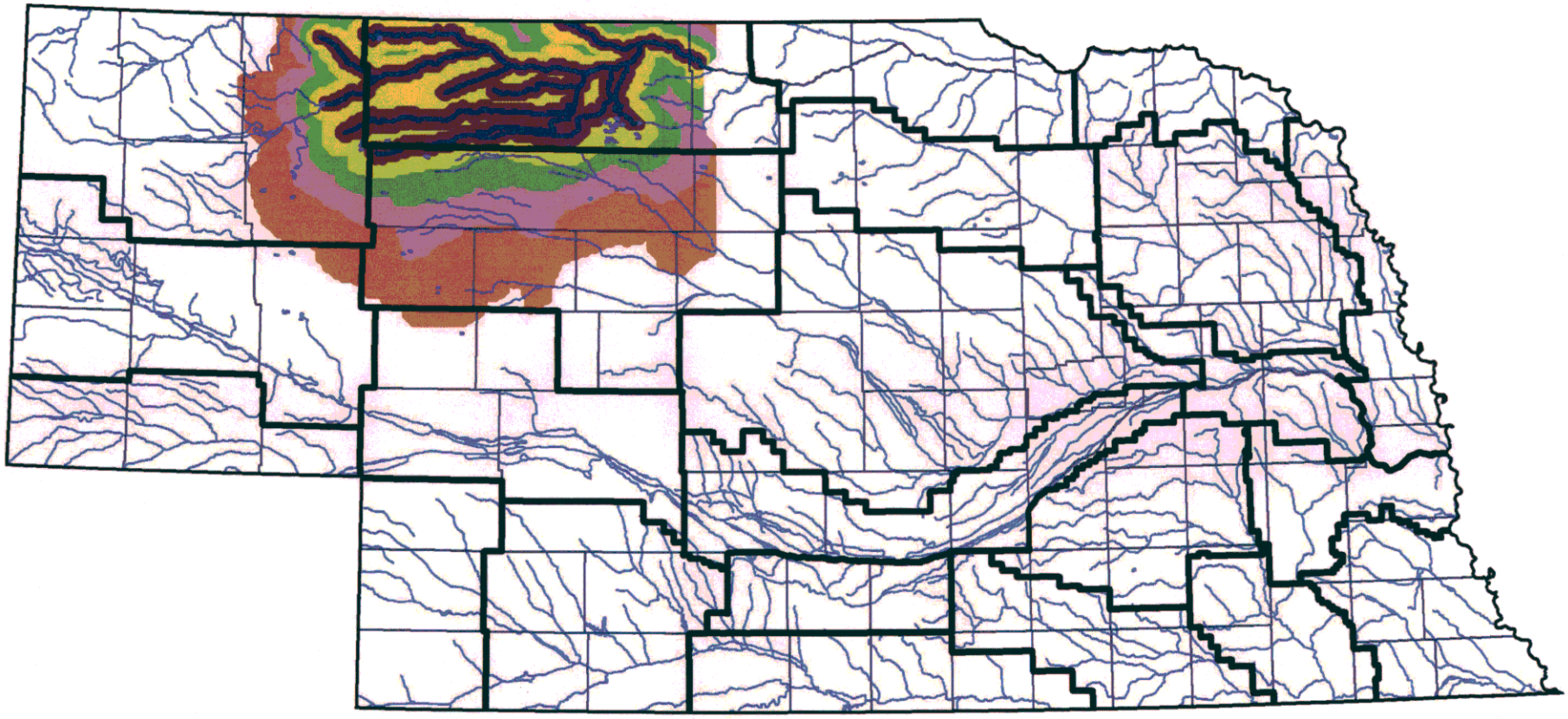
**Red Area - 0.1% / 100 years**
**Purple Area - 5% / 100 years**
**Green Area - 15% / 75 years**
**Goldenrod Area - 28% / 40 years**
**Dark Purple Area - 50% / 10 years**

**NRD Boundaries**
**Surface Water Basin Boundaries**

STATE'S EXHIBIT 6-7 9775 87105

# Stream Depletion Lines

## Middle Niobrara River

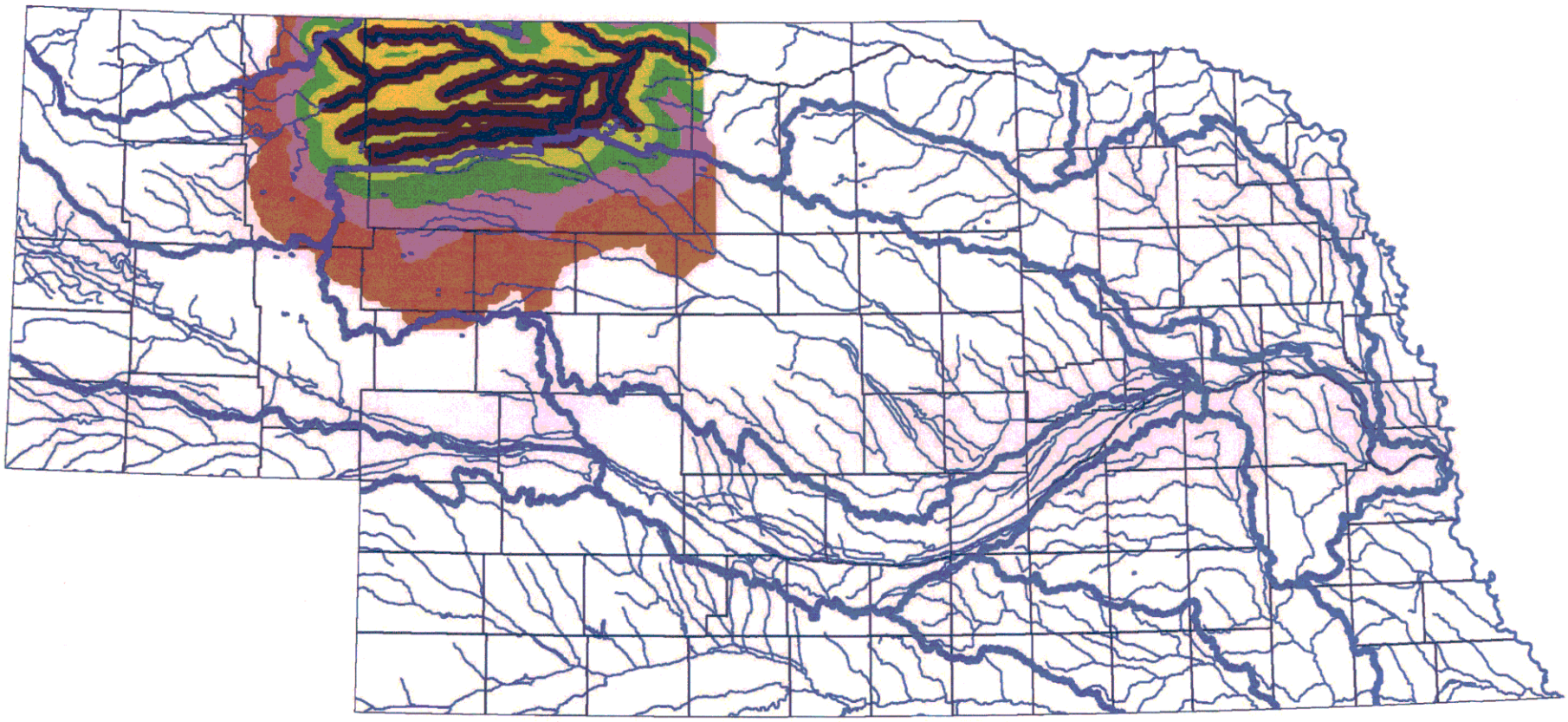


**Red Area - 0.1% / 100 years**
**Purple Area - 5% / 100 years**
**Green Area - 15% / 75 years**
**Goldenrod Area - 28% / 40 years**
**Dark Purple Area - 50% / 10 years**

**NRD Boundaries**

# Stream Depletion Lines

## Middle Niobrara River

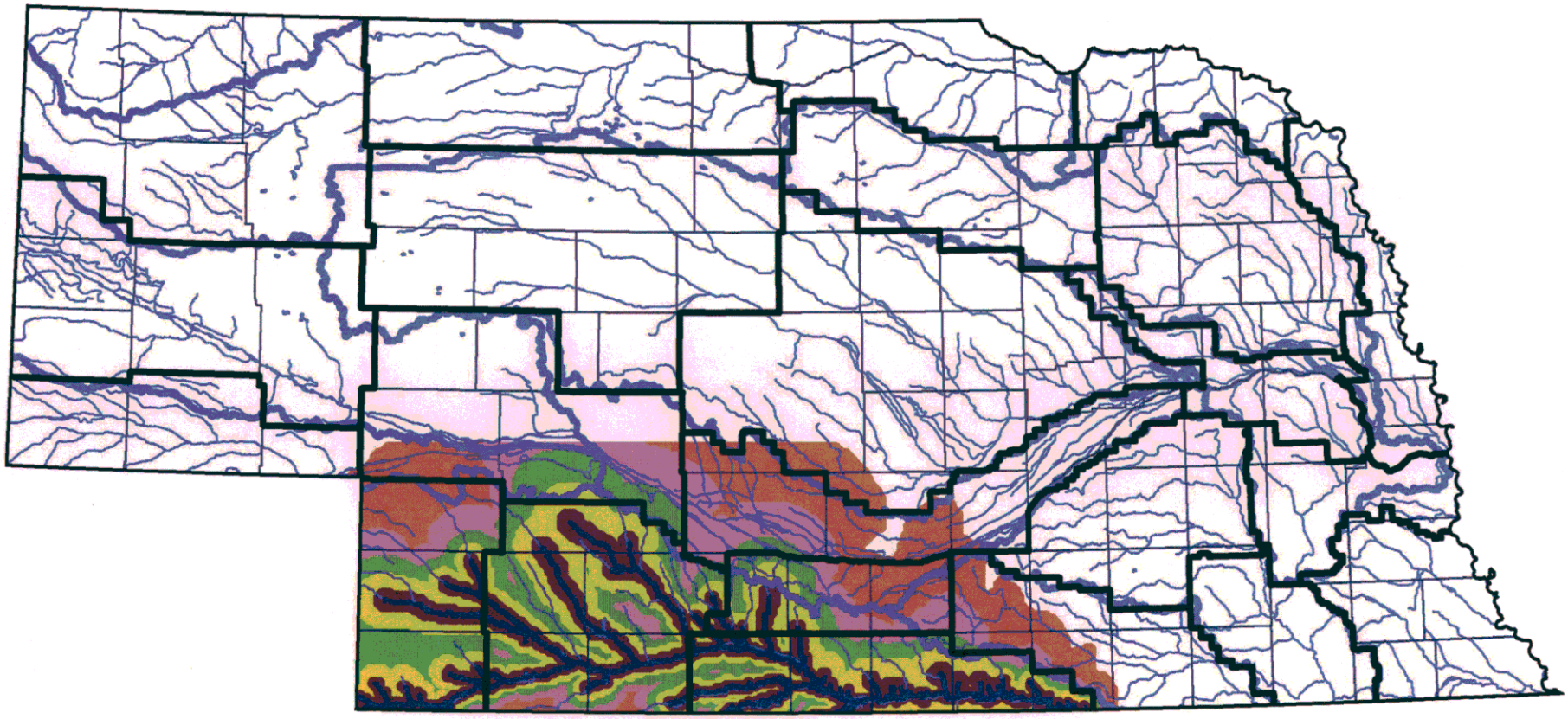


**Red Area - 0.1% / 100 years**
**Purple Area - 5% / 100 years**
**Green Area - 15% / 75 years**
**Goldenrod Area - 28% / 40 years**
**Dark Purple Area - 50% / 10 years**

**Surface Water Basin Boundaries**

# Stream Depletion Lines

## Republican River

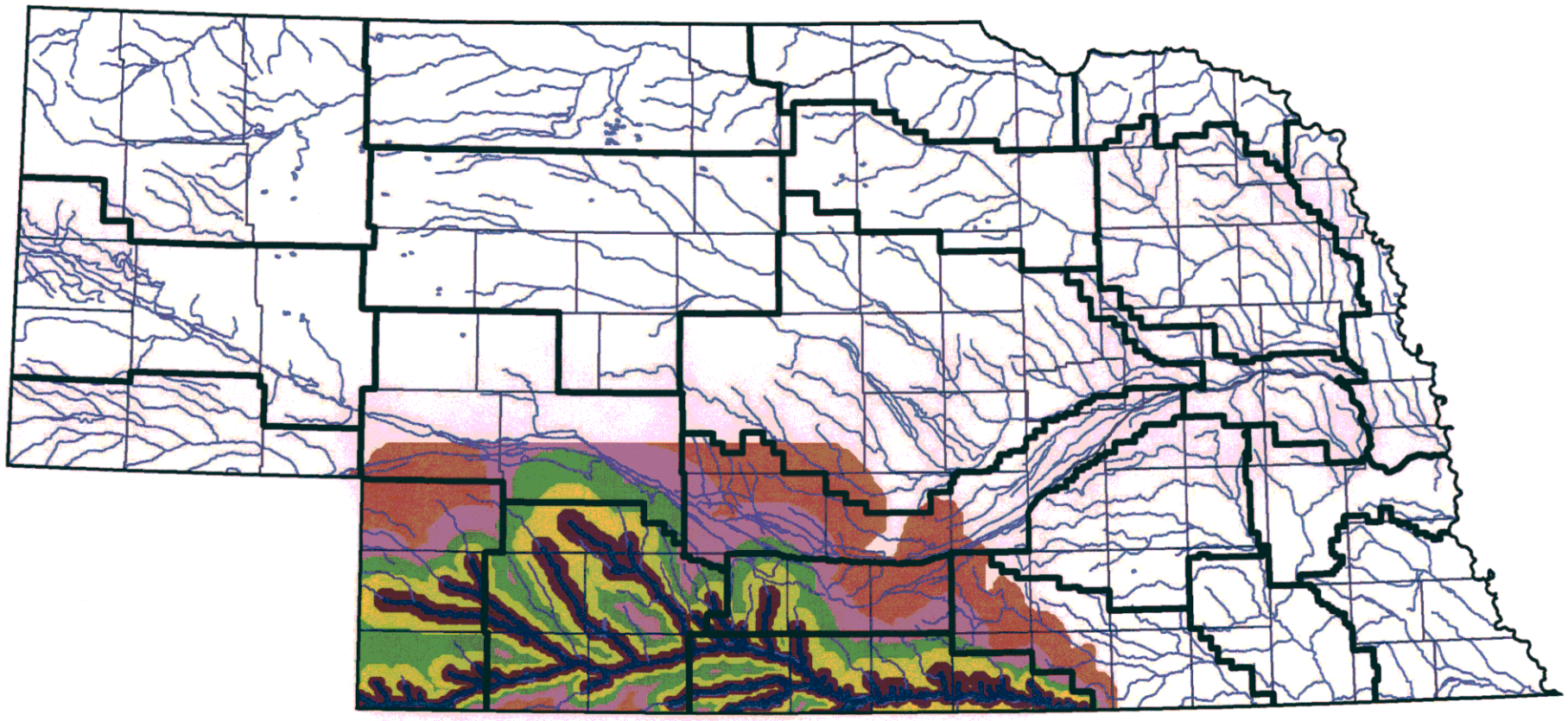


**Red Area - 0.1% / 100 years**
**Purple Area - 5% / 100 years**
**Green Area - 15% / 75 years**
**Goldenrod Area - 28% / 40 years**
**Dark Purple Area - 50% / 10 years**

NRD Boundaries
Surface Water Basin Boundaries

# Stream Depletion Lines

## Republican River

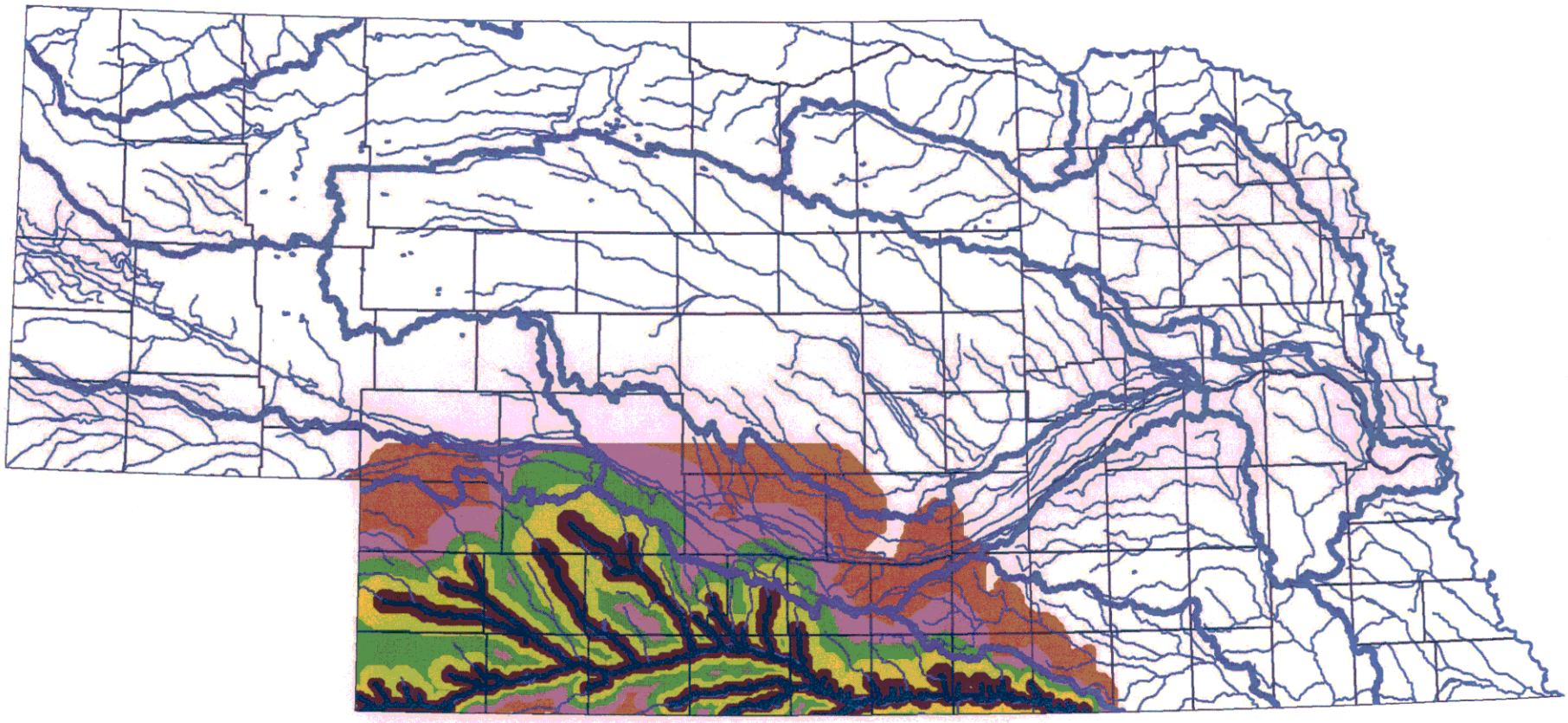


**Red Area - 0.1% / 100 years**
**Purple Area - 5% / 100 years**
**Green Area - 15% / 75 years**
**Goldenrod Area - 28% / 40 years**
**Dark Purple Area - 50% / 10 years**

**NRD Boundaries**

# Stream Depletion Lines

## Republican River



**Red Area - 0.1% / 100 years**
**Purple Area - 5% / 100 years**
**Green Area - 15% / 75 years**
**Goldenrod Area - 28% / 40 years**
**Dark Purple Area - 50% / 10 years**

**Surface Water Basin Boundaries**

# STATE OF NEBRASKA

Exhibit 9

DEPARTMENT OF NATURAL RESOURCES
**Roger K. Patterson**
*Director*

**Mike Johanns**
*Governor*

January 13, 2005

IN REPLY REFER TO:

TO: Negotiated Rulemaking Committee

FROM: Ann Bleed

SUBJECT: Technical Data and Draft Rule for your consideration

The following is a draft proposal for your consideration. Also enclosed are twp additional maps depicting hydrological conductivity. One shows Stream Depletion Lines (SDLs) for the Platte River, and the other shows the SDLs for all areas (Platte River, Republican River, and Niobrara River).

A stream will be considered as fully appropriated if, after considering the impact of the lag effect from existing groundwater pumping in the hydrologically connected area that will deplete stream flows within the next 40 years, there is insufficient stream flow in the river reach to meet the following interference criteria:

During the month of July for ___ years out of a total of ____ years, the stream flow exceeds ___% of the July crop irrigation requirement and

During the month of May through September for ___ years out of a total of ____ years, the stream flow exceeds ___% of the annual crop irrigation requirement and

The ground water area considered to be hydrologically connected to the fully appropriated ~~stream is any area within which a pumping well will cause a depletion to stream flow of ___% of~~ what is pumped in ___years.

Data to be used:
Surface water administrative records
Stream gage records
Registered well database
NRD ground water management plans
Water level records and maps from the NRDs, the NDNR, the U of N, the USGS.
Hydrographic reports
Technical hydrogeological reports from USGS, U of N, others.
Ground water models where available
Data required for determination of whether an investment in a new water right would be profitable.

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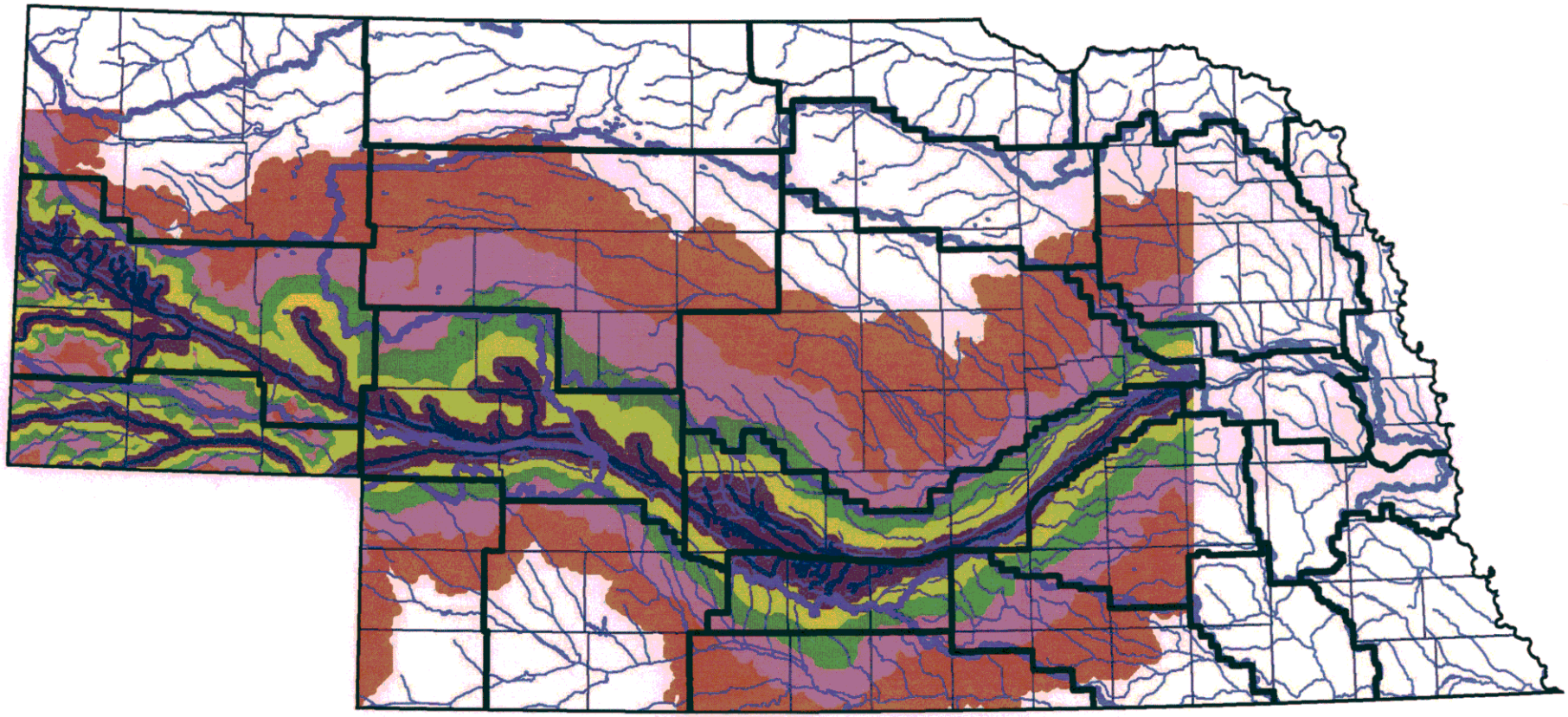
# Stream Depletion Lines

## Platte River

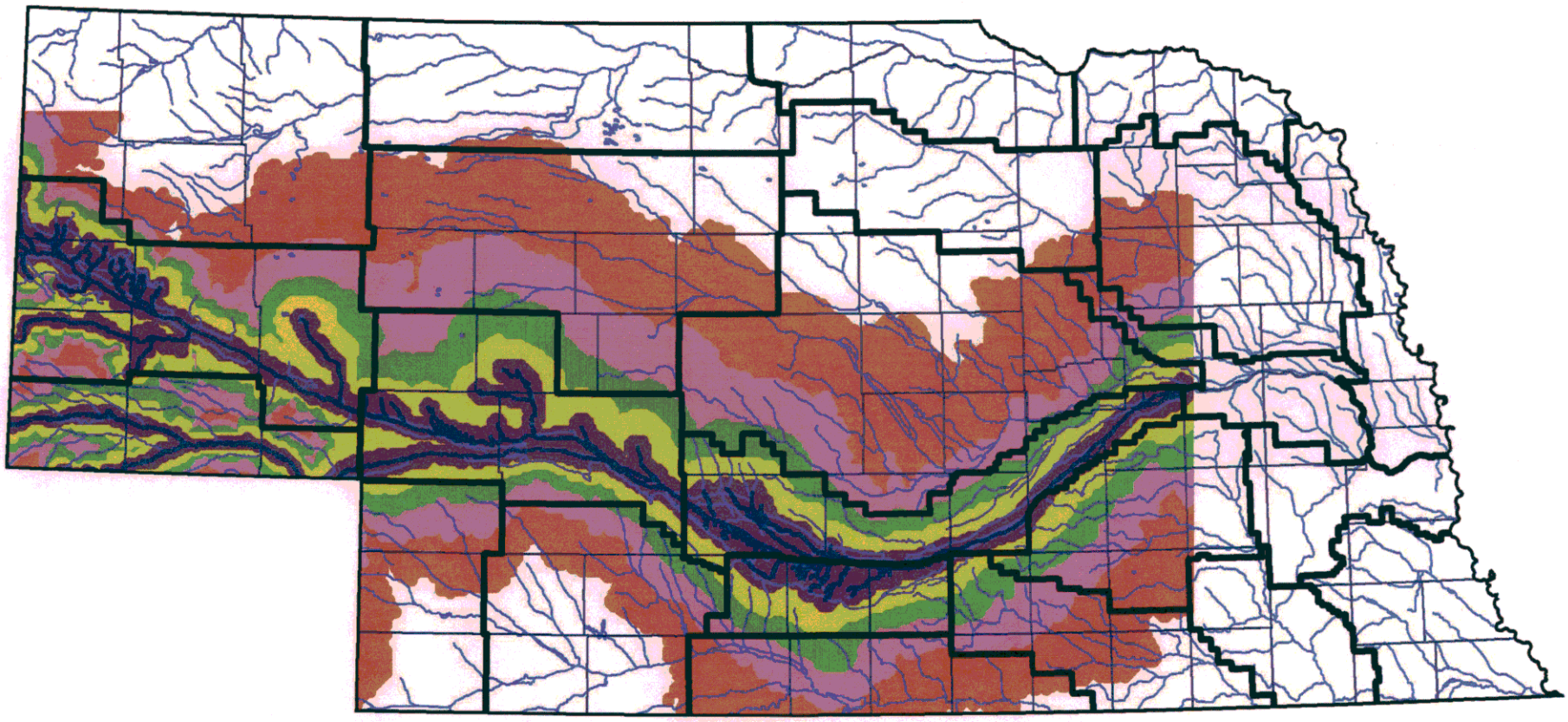


Red Area - 0.1% / 100 years
Purple Area - 5% / 100 years
Green Area - 15% / 75 years
Goldenrod Area - 28% / 40 years
Dark Purple Area - 50% / 10 years

NRD Boundaries
Surface Water Basin Boundaries

# Stream Depletion Lines

## Platte River

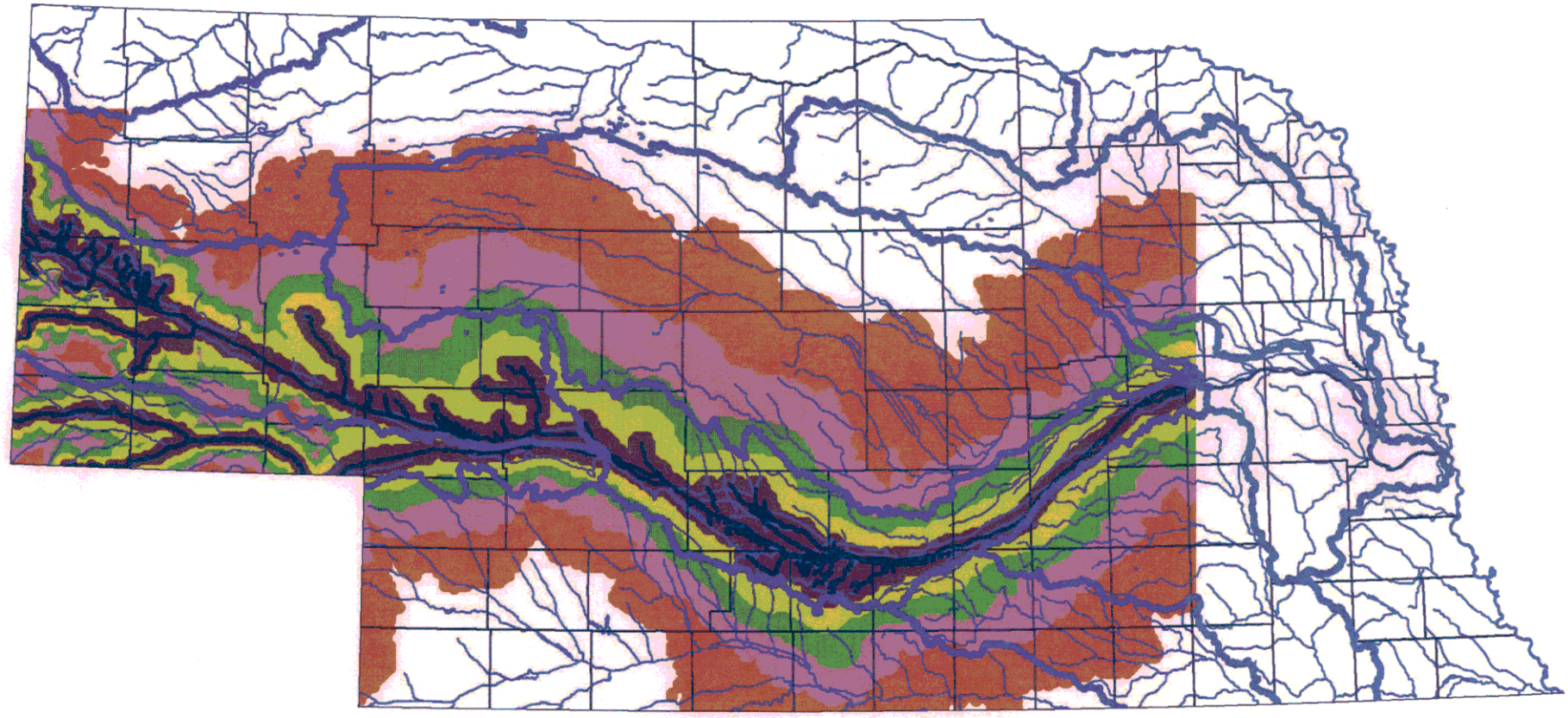


Red Area - 0.1% / 100 years
Purple Area - 5% / 100 years
Green Area - 15% / 75 years
Goldenrod Area - 28% / 40 years
Dark Purple Area - 50% / 10 years

NRD Boundaries

# Stream Depletion Lines

## Platte River

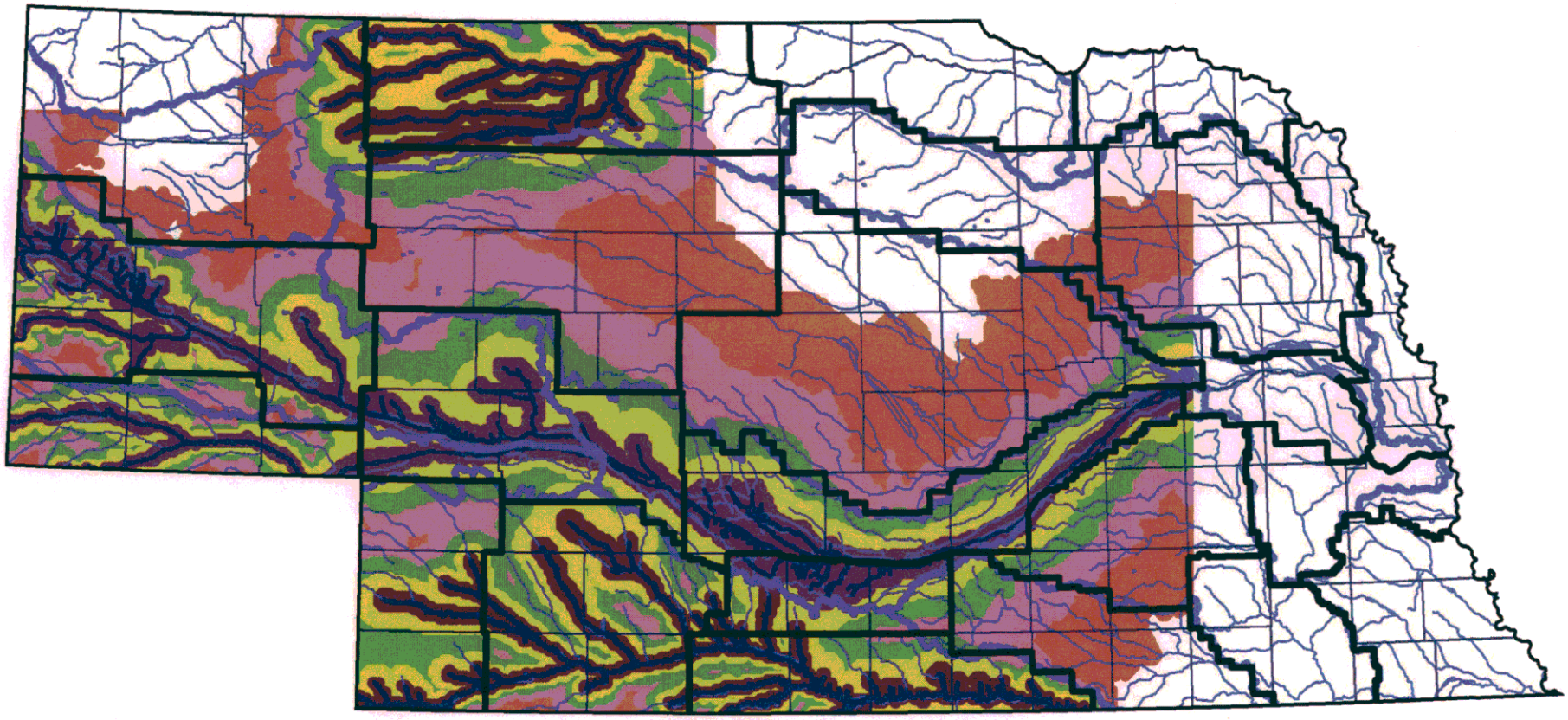


**Red Area - 0.1% / 100 years**
**Purple Area - 5% / 100 years**
**Green Area - 15% / 75 years**
**Goldenrod Area - 28% / 40 years**
**Dark Purple Area - 50% / 10 years**

**Surface Water Basin Boundaries**

# Stream Depletion Lines

## Middle Niobrara, Platte, and Republican Rivers

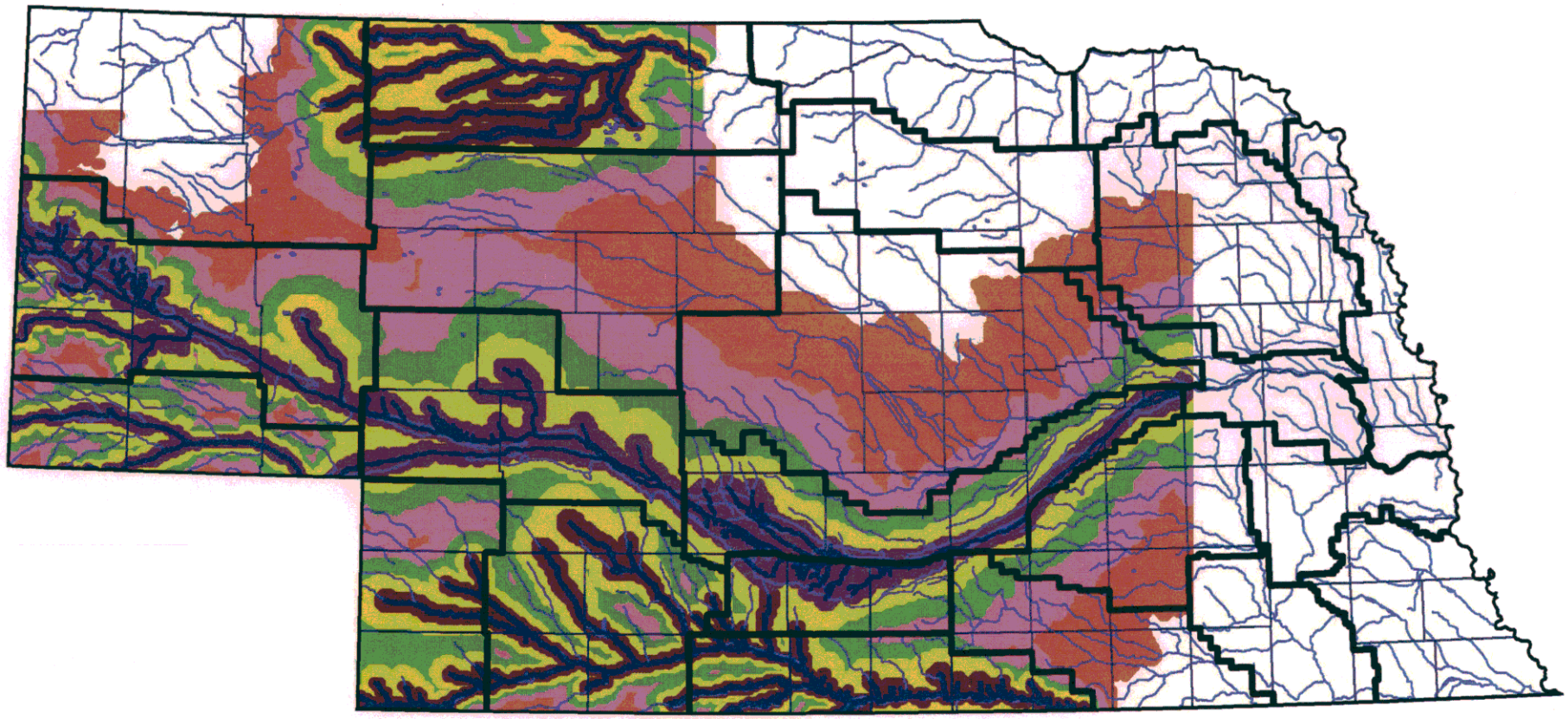


**Red Area - 0.1% / 100 years**
**Purple Area - 5% / 100 years**
**Green Area - 15% / 75 years**
**Goldenrod Area - 28% / 40 years**
**Dark Purple Area - 50% / 10 years**

NRD Boundaries
Surface Water Basin Boundaries

# Stream Depletion Lines

## Middle Niobrara, Platte, and Republican Rivers

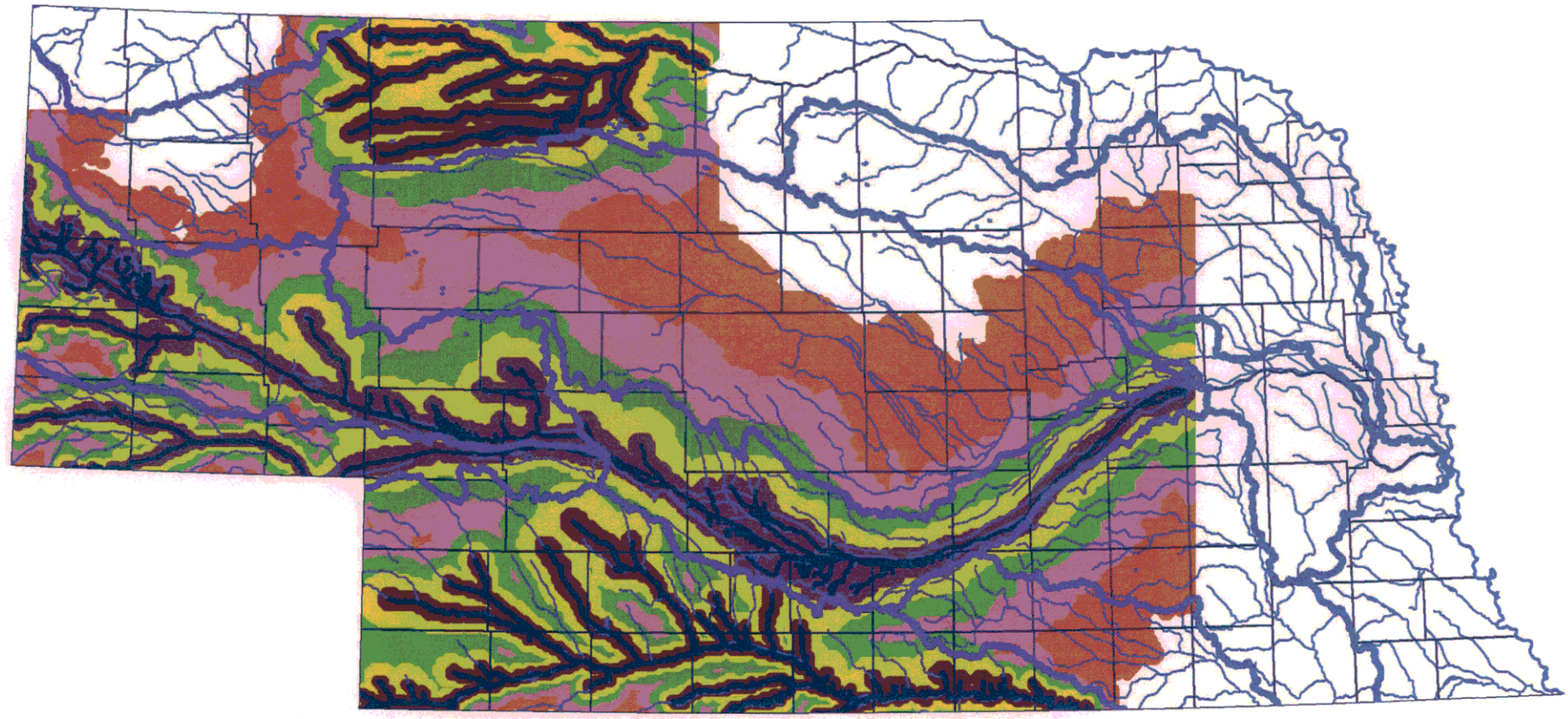


Red Area - 0.1% / 100 years
Purple Area - 5% / 100 years
Green Area - 15% / 75 years
Goldenrod Area - 28% / 40 years
Dark Purple Area - 50% / 10 years

NRD Boundaries

# Stream Depletion Lines

## Middle Niobrara, Platte, and Republican Rivers



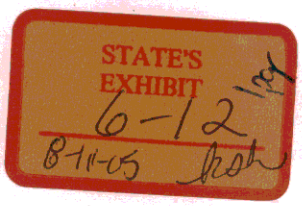
**Red Area - 0.1% / 100 years**
**Purple Area - 5% / 100 years**
**Green Area - 15% / 75 years**
**Goldenrod Area - 28% / 40 years**
**Dark Purple Area - 50% / 10 years**

**Surface Water Basin Boundaries**

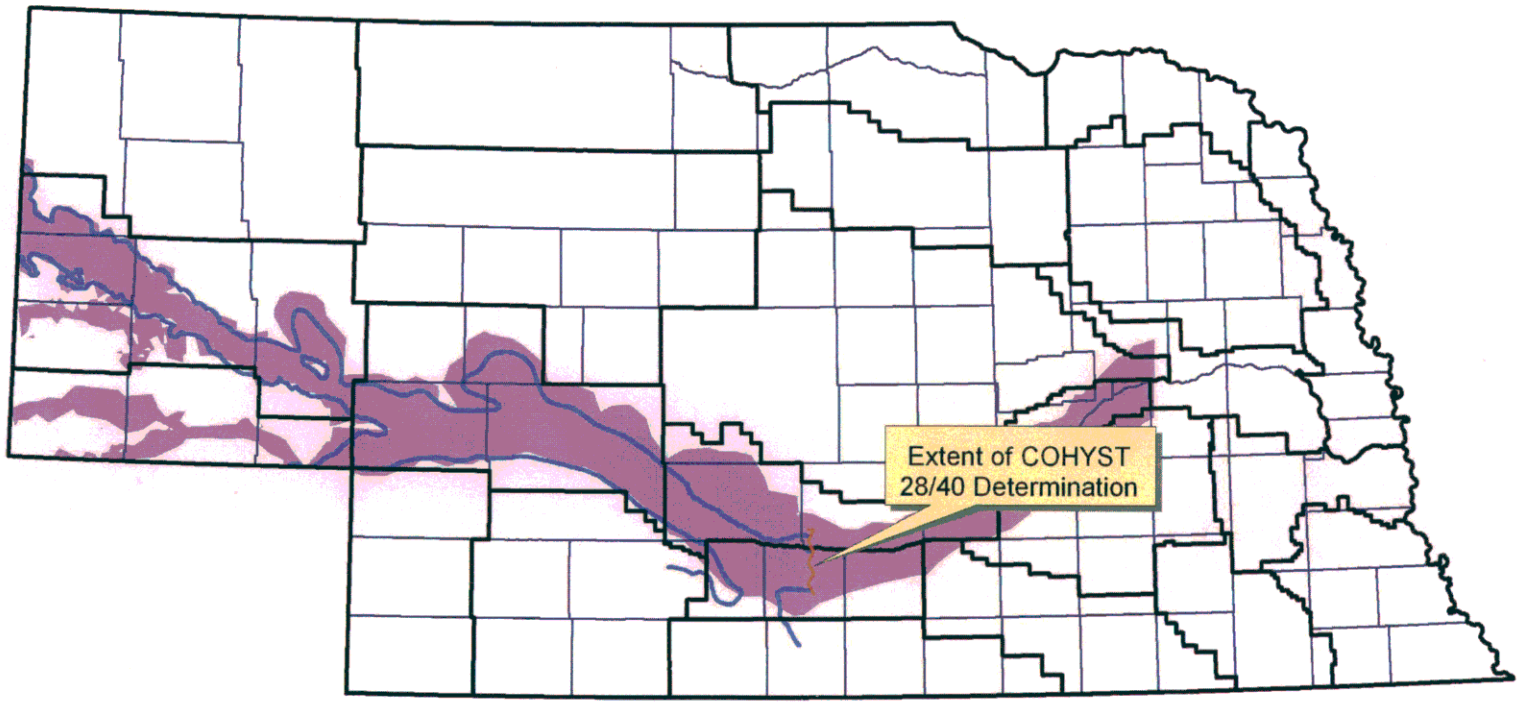
**Nebraska Department of Natural Resources**
**Negotiated Rulemaking Committee**
**Committee Timeline**
**December 8, 2004 (Revised)**

The timeline for the Negotiated Rulemaking Committee is extremely tight (the initial notice indicated that any report or draft rule from the Committee must be produced by March 1, 2005). The following is the schedule of meetings and possible tasks for the Negotiated Rulemaking Committee, with the goal of obtaining a final product by the end of the first week in March. All meetings will be from 10:00 a.m. until 2:00 or 3:00.

| **Meeting Date** | **Tasks/Location** |
|---|---|
| January 21, 2005 | Consider draft documents produced by the Department on the level of interference to be allowable, and hydrologic connectivity. Consider levels of interference and hydrologic connectivity utilized in other states. Work towards a baseline of understanding/thinking on the subject. Holiday Inn Convention Center, 110 2nd Avenue, Kearney |
| February 1, 2005 | Work on reaching agreement on both interference and hydrologic connectivity. Discuss options. Get draft of rules circulated to Committee members following meeting. Holiday Inn-downtown, 141 North 9th Street, Lincoln |
| February 16, 2005 | Work on refining rule. The Cornhusker, 333 South 13th Street, Lincoln |
| March 3, 2005 | Meet to finalize rule. Ramada Inn, 301 Second Avenue, Kearney |



# Stream Depletion Line Comparison



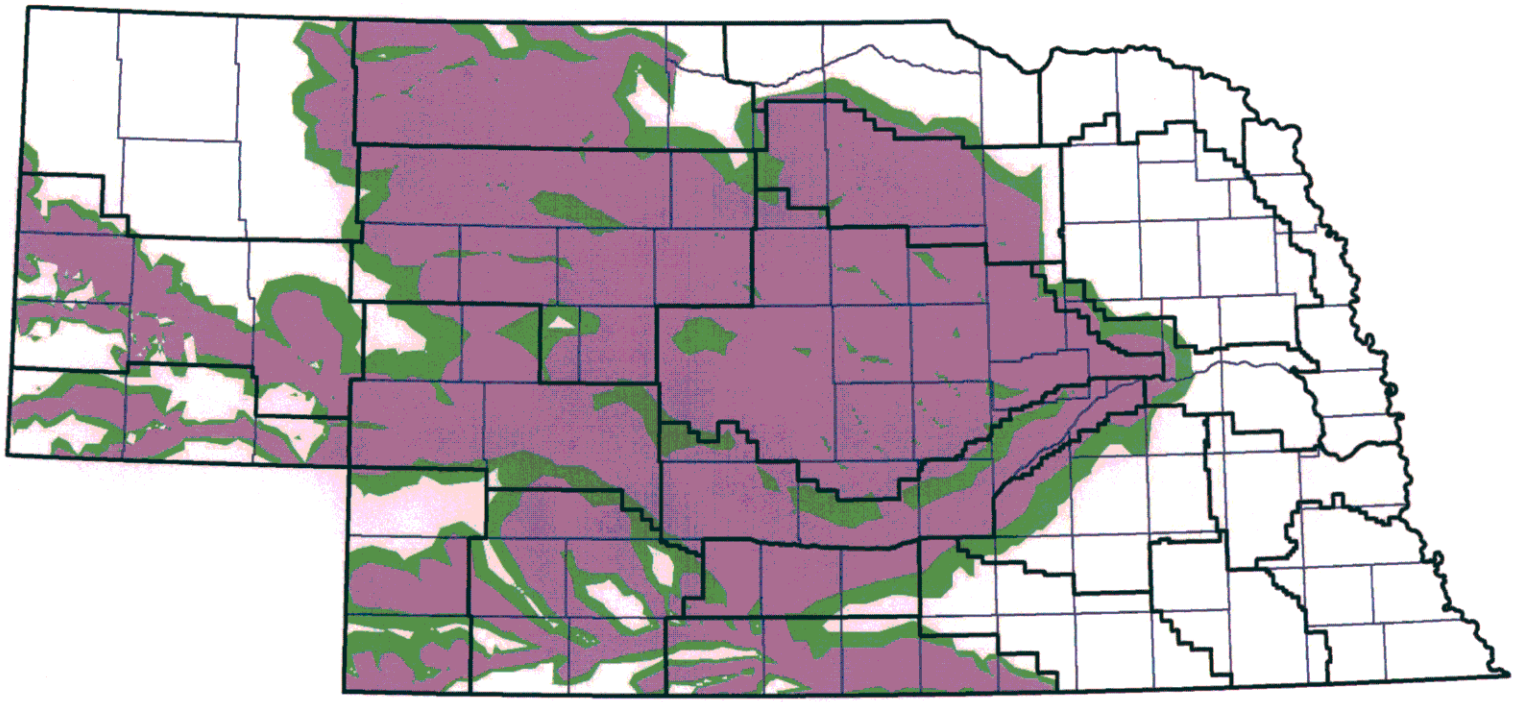

Purple Area - 28% Depletion/40-years
Blue Line - COHYST Drawn 28% Depletion/40-years Line

NRD Boundaries
County Boundaries

Unless otherwise noted, the depletion areas shown on this map were calculated by the Department of Natural Resources using Jenkins method for calculating stream depletion.

EXHIBIT 14

# Stream Depletion Line Comparison



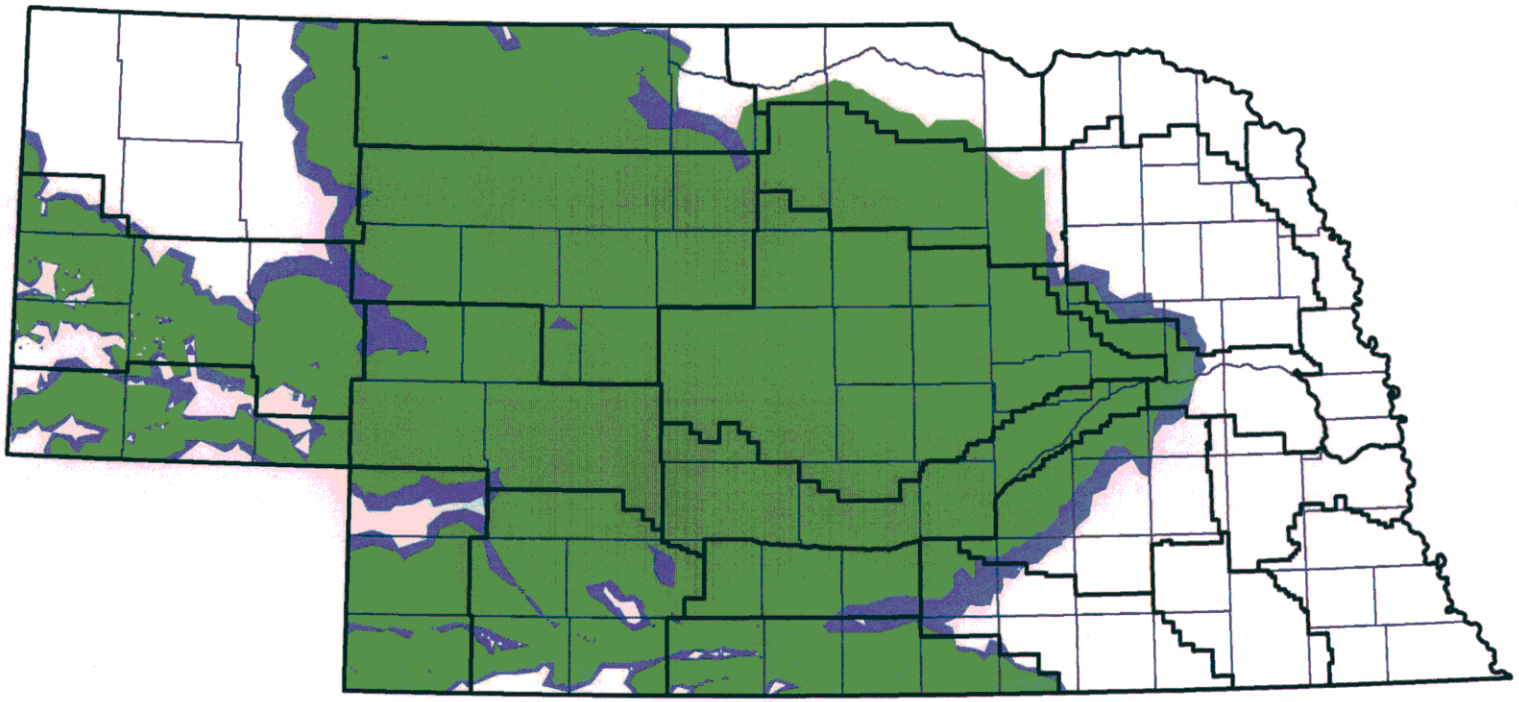
Purple Area - 28% Depletion/40-years
Green Area - 10% Depletion/50-years

NRD Boundaries
County Boundaries

Unless otherwise noted, the depletion areas shown on this map were calculated by the Department of Natural Resources using Jenkins method for calculating stream depletion.

EXHIBIT 15

# Stream Depletion Line Comparison



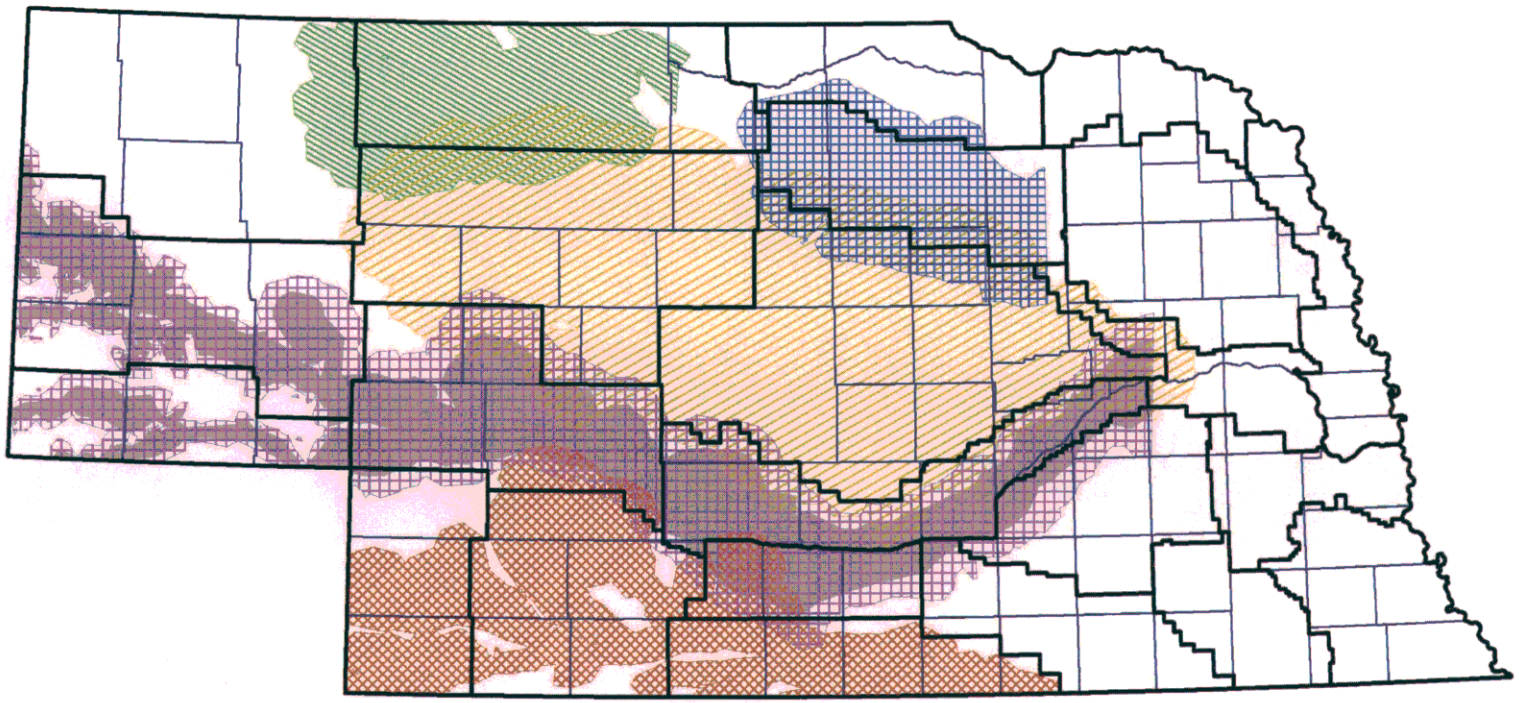
NRD Boundaries

County Boundaries

Blue Area - 2.5% Depletion/50-years
Green Area - 10% Depletion/50-years

Unless otherwise noted, the depletion areas shown on this map were calculated by the Department of Natural Resources using Jenkins method for calculating stream depletion.

# Stream Depletion Line Comparison



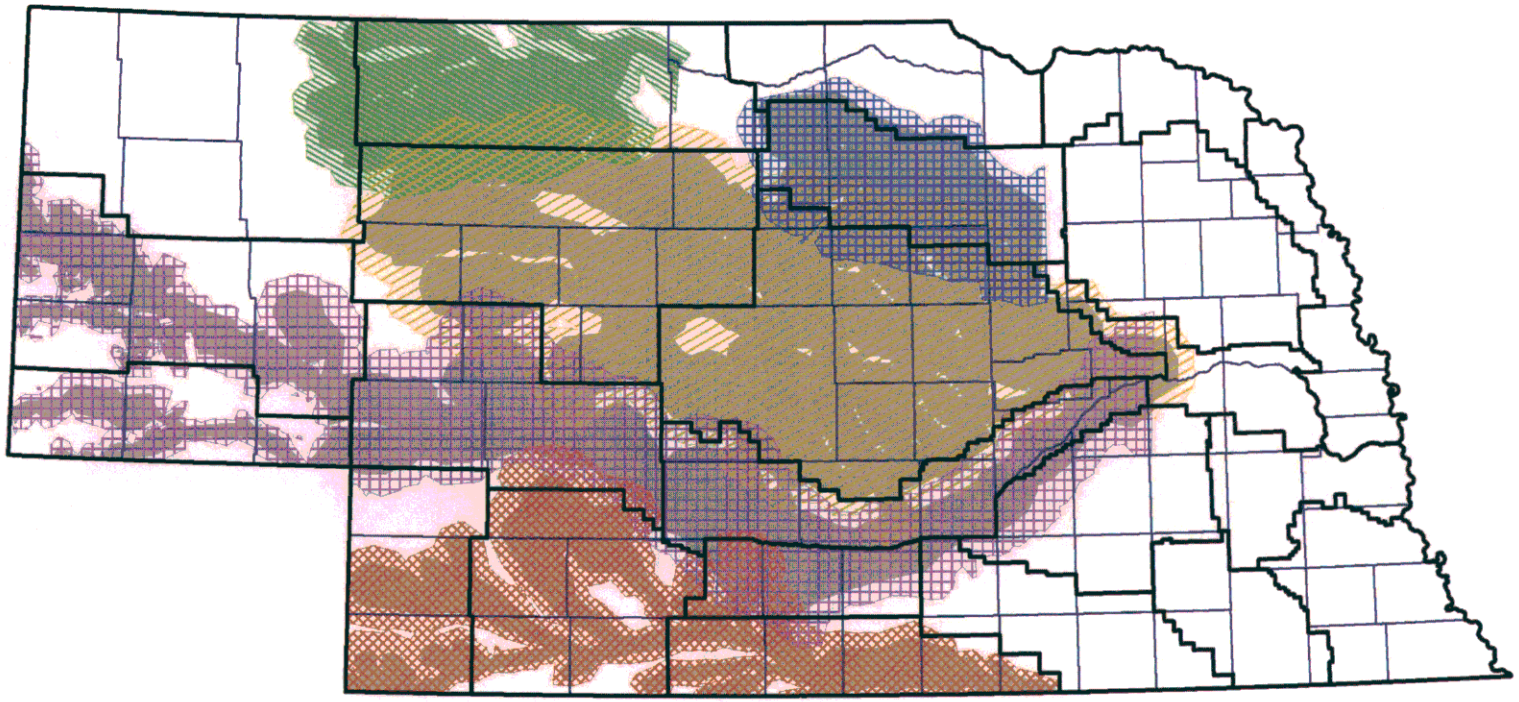
Purple Area - 10% Depletion/50-years - Platte
Green Area - 10% Depletion/50-years - Niobrara
Orange Area - 10% Depletion/50-years - Loup
Blue Area - 10% Depletion/50-years - Upper Elkhorn
Red Area - 10% Depletion/50-years - Republican
Gray Area - 28% Depletion/40-years - Platte

NRD Boundaries
County Boundaries

Unless otherwise noted, the depletion areas shown on this map were calculated by the Department of Natural Resources using Jenkins method for calculating stream depletion.

EXHIBIT 17

# Stream Depletion Line Comparison



Purple Area - 10% Depletion/50-years - Platte
Green Area - 10% Depletion/50-years - Niobrara
Orange Area - 10% Depletion/50-years - Loup
Blue Area - 10% Depletion/50-years - Upper Elkhorn
Red Area - 10% Depletion/50-years - Republican
Gray Area - 28% Depletion/40-years

NRD Boundaries
County Boundaries

Unless otherwise noted, the depletion areas shown on this map were calculated by the Department of Natural Resources using Jenkins method for calculating stream depletion.

STATE'S EXHIBIT 6-17 14
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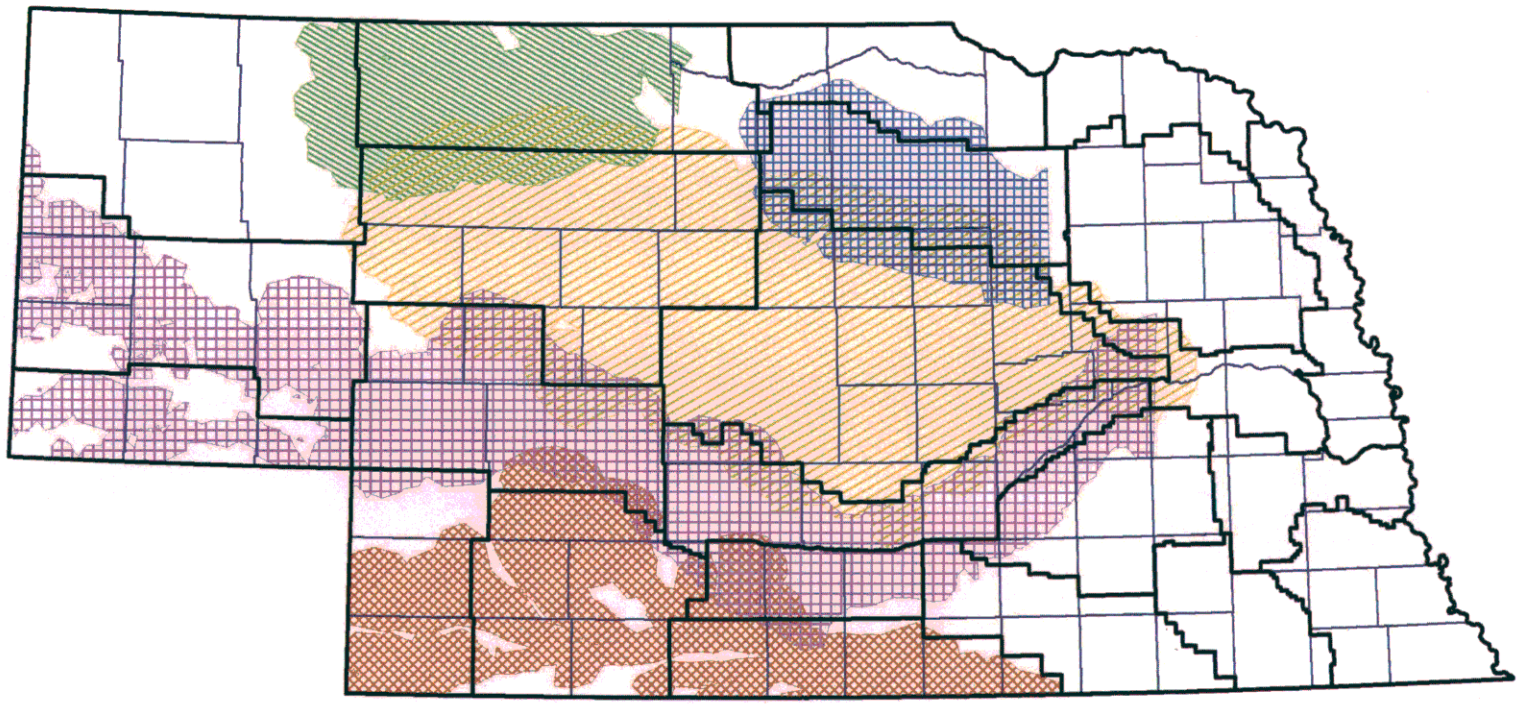
EXHIBIT 18

# Stream Depletion Line Comparison



Purple Area - 10% Depletion/50-years - Platte
Green Area - 10% Depletion/50-years - Niobrara
Orange Area - 10% Depletion/50-years - Loup
Blue Area - 10% Depletion/50-years - Upper Elkhorn
Red Area - 10% Depletion/50-years - Republican

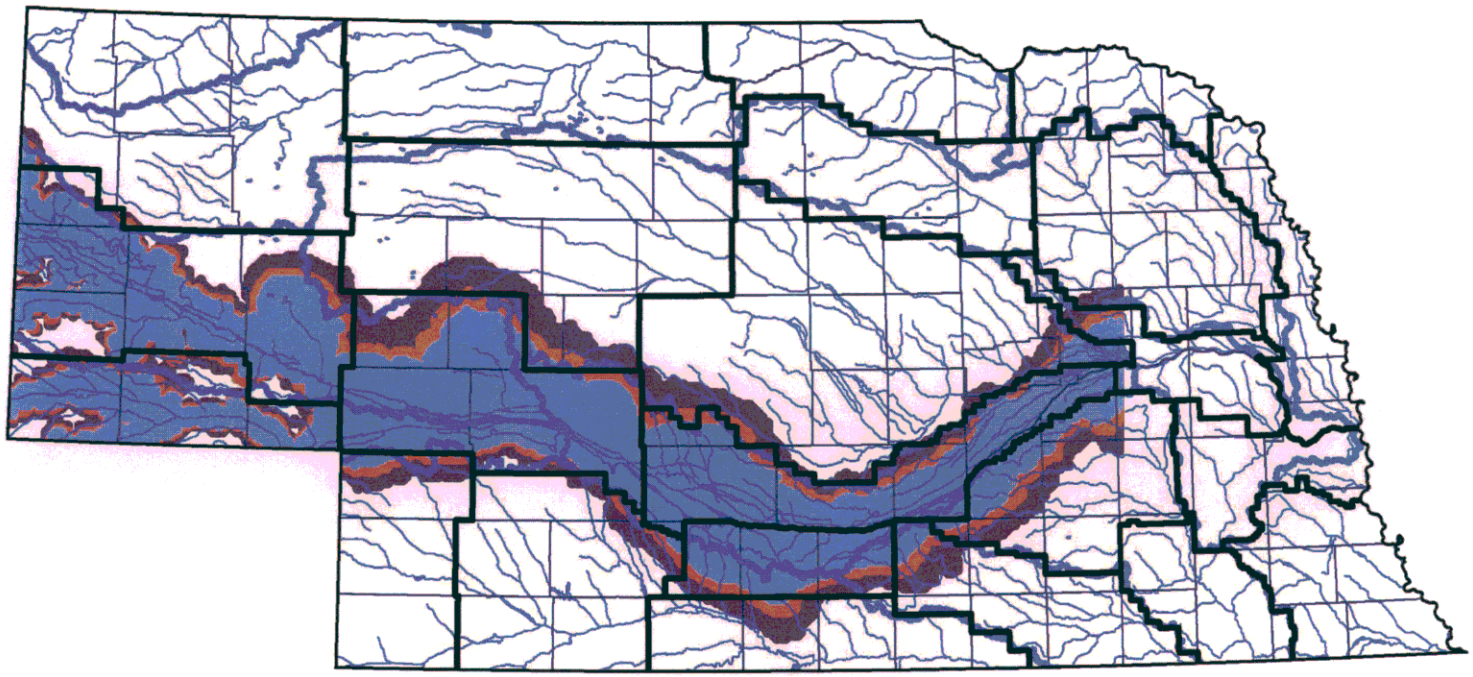
NRD Boundaries
County Boundaries

Unless otherwise noted, the depletion areas shown on this map were calculated by the Department of Natural Resources using Jenkins method for calculating stream depletion.

STATE'S EXHIBIT
6-18
8-1-05

EXHIBIT 19

# Stream Depletion Lines
# Platte River Basin

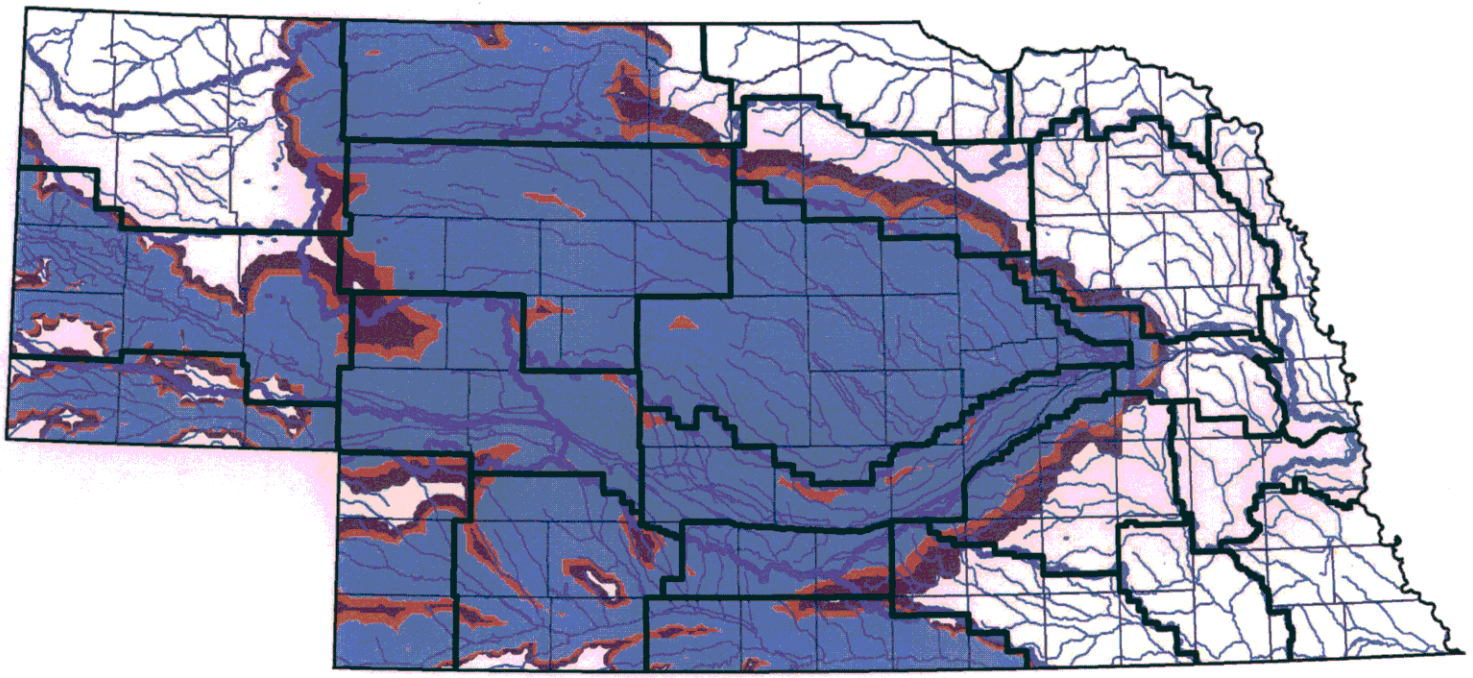


**Light Blue Area - 25% 50-years**
**Red Area - 15% 50-years**
**Purple Area - 5% 50-years**

NRD Boundaries
River Basin Boundaries
County Boundaries
Rivers and Streams

EXHIBIT 20

# Stream Depletion Lines
# Loup, Niobrara, Platte, and Republican River Basins

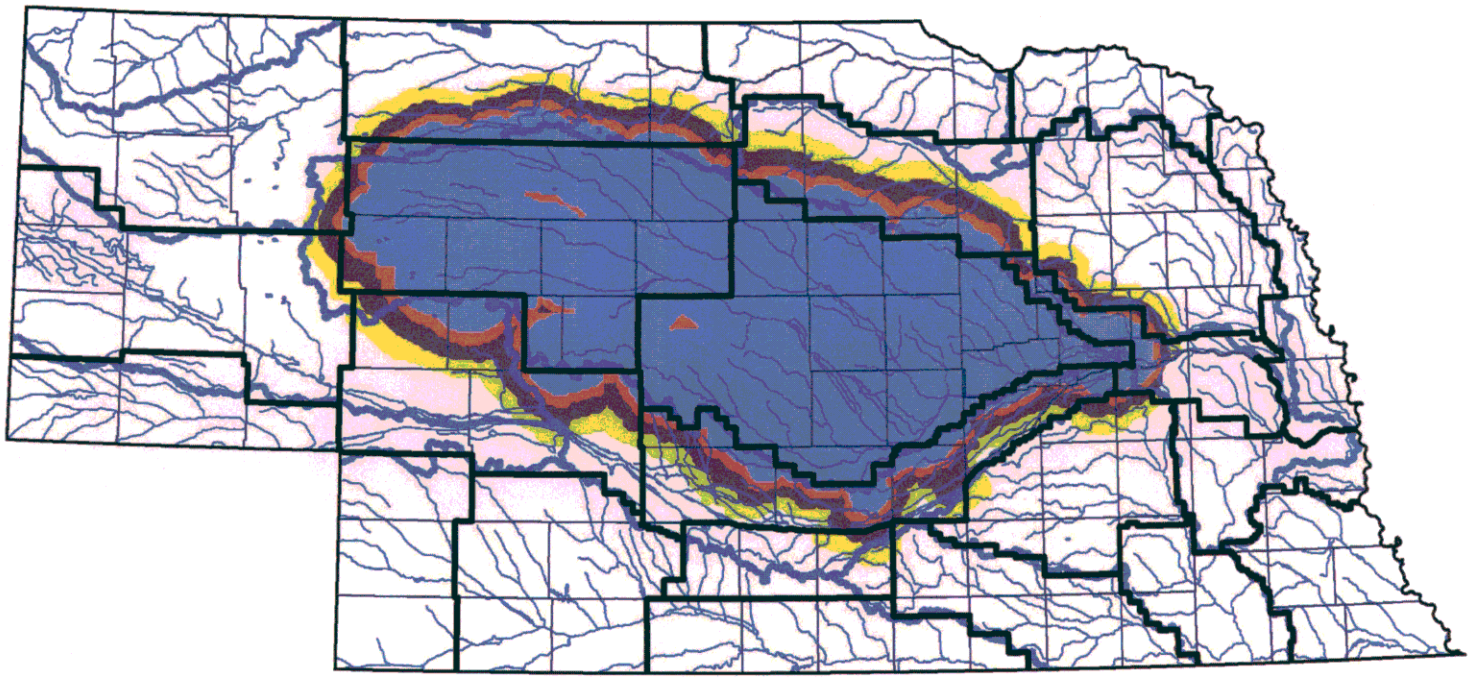


**Light Blue Area - 25% 50-years**
**Red Area - 15% 50-years**
**Purple Area - 5% 50-years**

NRD Boundaries
River Basin Boundaries
County Boundaries
Rivers and Streams

EXHIBIT 21

# Stream Depletion Lines
# Loup River Basin



**Light Blue Area - 25% 50-years**
**Red Area - 15% 50-years**
**Purple Area - 5% 50-years**
**Yellow Area - 1% 50-years**

NRD Boundaries
River Basin Boundaries
County Boundaries
Rivers and Streams

## Considerations For Determining "Fully Appropriated" Areas

The Nebraska Supreme Court has noted that the methodology used to determine the existence of unappropriated water is "a question of law." *Central Platte Natural Res. Dist. v. State of Wyoming*, 245 Neb. 439, 445, 513 N.W.2d 847, 854 (1994). In reviewing that question of law, the Court determined that the amount of unappropriated water must be fairly continuous and dependable to serve the purposes for which the application was made. *Id.* At 453-454, 859. Because the methodology for determining unappropriated water is legal and flexible, a sweeping conclusion of what constitutes a "fully appropriated" area will need to be done with care.

Nebraska Revised Statutes § 46-713(3) sets forth three broad parameters within which a "river basin, subbasin, or reach" will be deemed "fully appropriated": (1) the surface water supply will be insufficient to sustain, over the long term, purposes for existing natural flow and the purposes for which instream flow appropriations were granted; (2) the surface water supply will be insufficient to sustain, over the long term, the beneficial uses from wells located in aquifers dependent on recharge from the surface flows; and (3) reductions in streamflow are sufficient to cause noncompliance with compacts, decrees, formal state contracts, agreements, or applicable state or federal laws. Each of these parameters focus on the harm to existing uses or obligations as a means to determine whether an area is fully appropriated.

With the foregoing in mind, an area should be judged "fully appropriated" as follows:

**Fully Appropriated.** A stream/river basin, subbasin, or reach shall be "fully appropriated" when any of the following occurs:

(a) Within the next 10 year period, the flow of the stream/river is calculated to be insufficient to provide 70% of the water needed to meet or exceed the most junior irrigation appropriation located within that basin, subbasin, or reach at least 70% of the time.

(b) Within the next 10 year period, the flow of the stream/river is calculated to be insufficient to provide for the instream flow water rights located within that basin, subbasin, or reach, at least 20% of the time.

(c) Within the next 10 year period, the flow of the stream/river at a given point is calculated to be insufficient to provide recharge to aquifers, or portions of aquifers, in amounts that will sustain the existing uses of water withdrawn from wells located in those aquifers or portions thereof. Only wells placed at a depth and location to withstand normal seasonal fluxuations in the static water level of the aquifer during periods of drought shall be considered when determining the fully appropriated status;

(d) Because of existing uses, the flow of the stream/river has declined, or is calculated to decline to such an extent that the State of Nebraska will be in substantial noncompliance with an interstate compact, decree, legally enforceable contract/agreement or with a state or federal law.

Future steamflows shall be calculated only by using models and/or techniques that provide a reasonable degree of scientific certainty and shall take into account, if applicable, existing reservoir operations. Such calculations shall consider only the effects of wells and surface water appropriations actually in existence. Only the wells located within the _____line shall be used to model the future depletions to streamflow.

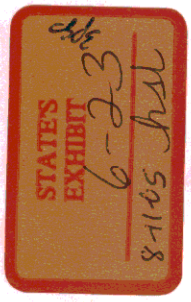
# Basic Assumptions Used in the Development of the Department of Natural Resources Proposed Method to Determine Whether a Stream and the Hydrologically Connected Ground Water Aquifers Are Fully Appropriated

Nebraska Revised Statutes § 46-713(3) sets forth three criteria for determining whether a river basin, subbasin, or reach is fully appropriated: (1) the surface water supply will be insufficient to sustain, over the long term, purposes for existing natural flow and the purposes for which instream flow appropriations were granted; (2) the surface water supply will be insufficient to sustain, over the long term, the beneficial uses from wells located in aquifers dependent on recharge from the surface flows; and (3) reductions in streamflow are sufficient to cause noncompliance with compacts, decrees, formal state contracts, agreements, or applicable state or federal laws. This memo will address the assumptions relied upon to develop the method the Department proposes to use to address items 1 and 2 of the statute.

Put simply, any ground water aquifer that is hydrologically connected to a fully appropriated stream is also fully appropriated because in such a case the surface water and hydrologically connected ground water are both part of one interconnected system. If there is additional consumptive use of water in the ground water aquifers connected to the stream, eventually this additional consumption will cause not only additional depletions to the aquifer but also additional depletion to the stream. A depletion in one component of this system depletes the other components. The addition of a new well that removes water from the aquifer will either intercept and consume water that otherwise would have flowed to the stream or cause more water to flow from the stream to the aquifer. In either case, there will be an additional depletion to both the aquifer and the stream. If a stream is fully appropriated, than any additional depletion to the stream or aquifer will cause an increased adverse affect to the surface water appropriators and criterion 1 for the determination of a fully appropriated stream will be met. In essence, because of the nature of the physical system, the existence of junior surface water rights that are short of water is like a canary in the coal mine; the junior water rights act as an alarm system signaling that there should be cause for concern. The following explains the basis for this assertion.

<u>Test 1: Assumptions Relied Upon to Address Criterion 1 - the determination of whether an additional use, given future lag effects from existing wells, will cause the surface water supply to be insufficient to sustain, over the long term, purposes for existing natural flow and the purposes for which instream flow appropriations were granted.</u>

The nature of the connection between the stream and the aquifer determines how much and how fast water will flow between the stream and the aquifer. Water flows from or to a stream in response to the difference in the hydrologic head between the stream and the aquifer. Hydrologic head in ground water is a function of the combination of both the elevation and the pressure of the water. In other words water flows downhill in response to gravity and uphill in response to pressure from the weight of overlying aquifer



materials and water. Water flows down the head gradient from areas of higher hydrologic head to areas of lower hydrologic head.

In the case of a gaining stream, the water in the aquifer has a higher hydraulic head than the stream and water flows down gradient from the aquifer to the stream. In this situation, the addition of a pumping ground water well that removes water from the aquifer will lower the hydraulic head of the ground water in the aquifer and decrease the gradient between the higher hydraulic head in the aquifer and the lower hydraulic head stream. The decrease in the hydraulic gradient results in less water flowing from the aquifer to the stream.

In the case of a losing stream the water in the stream is at a higher hydraulic head than the ground water and water flows down gradient from the stream to the aquifer. As before, the addition of a pumping ground water well that removes water from the aquifer will lower the hydraulic head of the ground water in the aquifer and decrease the gradient between the aquifer and the stream. In this case the well will increase the hydraulic gradient between the higher head of the stream and the lower head in the aquifer and more water will flow from the stream to the aquifer, further depleting the stream.

In either case, if the stream itself is already determined to be fully appropriated, than the whole integrated system must be fully appropriated.

Test 2: Assumptions Relied Upon to Address Criterion 2 - the surface water supply will be insufficient to sustain, over the long term, the beneficial uses from wells located in aquifers dependent on recharge from the surface flows.

The first question that must be addressed is under what conditions would a stream and hydrolgoically connected aquifer system be declared to not be fully appropriated under Test 1 but be fully appropriated under Test 2. In this case, all the demands of the surface water rights would be satisfied but the water in the ground water aquifer would be insufficient for the existing wells. Such a system could not happen on a gaining stream because if the ground water were insufficient to sustain the wells, there would be little or no water in the stream for the surface water users. According to Bentall and Shafer (1979) most streams in the State of Nebraska are gaining streams[1].

The remaining case would be a losing stream on which surface water rights were satisfied but well demands were not. Such a stream would have to have surface water runoff that exceeded the demands of any surface water right or it would be determined to be fully appropriated under Test 1. It would also have to have ground water wells for which the stream flow was a critical component of the supply. Such physical systems occur in areas where there is either very little recharge to the aquifer from precipitation and or little

[1] Availability and Use of Water in Nebraska 1975. 1979. Nebraska Water Survey Paper Number 48. Conservation and Survey Division Institute of Agriculture and Natural Resources, University of Nebraska Lincoln.

recharge from a surrounding ground water system. In such cases, the aquifers tend to be isolated and tend to only support small livestock and domestic wells.

Such a physical system does exist on the White and Hat Creeks in western Nebraska where isolated fractured Brule formations are in close hydrologic connection to the stream but not to a surrounding ground water system. However, these streams have already been declared fully appropriated because the demands of the existing surface water rights are not met. There may also be such isolated physical systems in other parts of the state such as in the glacial till area of the eastern part of the state and along the Missouri River, but like the White River and Hat Creek, if the demands of the hydrologically wells are not being met, it is unlikely that the demands of any existing surface water rights would be met.

Nevertheless, if deemed necessary, the Department could make an effort to find wells which cannot pump sufficient water to meet their demand that are likely to be hydrologically connected to a stream that is not fully appropriated. If such situations exist, an integrated management plan could be prepared to address this situation.